Products finishing

HOWARD CAMPBELL, Editorial Director
FRED W. VOGEL, Managing Editor

Volume 2 | DECEMBER, 1937 | Number 3

DON G. GARDNER
President and
General Manager

•

JOHN M. KRINGS
Advertising Manager

G. M. FILLMORE
342 Madison Ave.
New York
Murray Hill 6-3899

J. H. KOCH
431 Main St.
Cincinnati, O.
Main 0182

GEORGE H. MEYERS
Tribune Tower, Chicago
Superior 8329

IVER W. LEE,
122 East 7th St.
Los Angeles
Vandike 3916

Member

CCA

CONTENTS

The Contact Zone Between the Zinc Coating and Base Metal in Hot-Dip Galvanizing..... 7
By Wallace G. Imhoff

Color In Metal Finishes As A Sales Factor..... 14
By Lawrence Blazey

Heating Corrosive Liquids..... 18
By Carl E. Heil

Decorative Finishes For Zinc Alloy Die Castings..... 22
By R. E. Kellers

Barrel Finishing of Metal Products..... 24
By H. Leroy Beaver

Composition of Modern Grinding Materials..... 30
By Henry R. Power

Sixteenth Exposition of Chemical Industries..... 32

The Finishing Forum..... 38

Finishes That Aid In Appearance and Utility..... 40

News of The Industry..... 42

New Plant Equipment and Materials..... 46

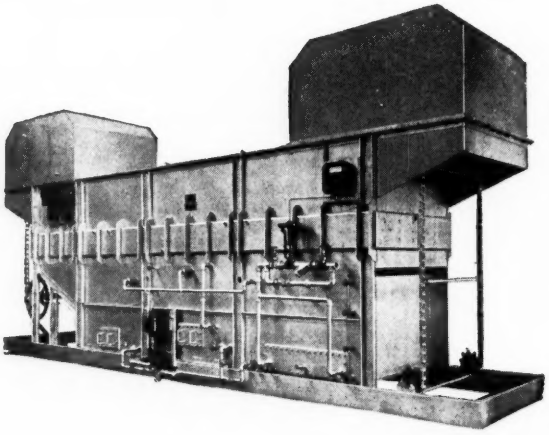
Index To Advertisements..... 64

Published monthly by Gardner Publications, Inc., 431 Main St., Cincinnati, Ohio.

Copyrighted

More Than 14,000 Circulation This Issue

DETREX DEGREASERS



FOR PRODUCTION CLEANING AT LOWER COST

In comparing cleaning methods, look to quality and unit cost—and let proved performance point the way to your decision!

It will pay you to investigate the improved Detrex Solvent Degreasing Process. You will find, as have many others, that it is faster . . . safer . . . more flexible . . . more convenient . . . more economical. It is *the* industrial cleaning process that simplifies cleaning, increases production speed, lowers costs, and gives a better job.

From the complete line of Detrex Degreasers—ranging from small standard models to large, conveyorized machines—you can choose the unit to meet your cleaning requirements. Our engineers will gladly assist you in your cleaning problems.

Write for complete information and booklet—
"Scientific Metal Cleaning."

DETROIT REX PRODUCTS COMPANY

Metal Cleaning Engineers—Solvent Degreasing—Alkali Cleaning

13005 Hillview Avenue **Detroit, Michigan**

New York Office: 130 W. 42nd St.
Cleveland Office: 812 Huron Rd.
Chicago Office: 201 N. Wells St.
Cincinnati Office: Provident Bank Bldg.

Products Finishing

Cincinnati, Ohio Vol. 2, No. 3

December, 1937

Contact Zone Between the Zinc Coating and the Base Metal in Hot-Dip Galvanizing

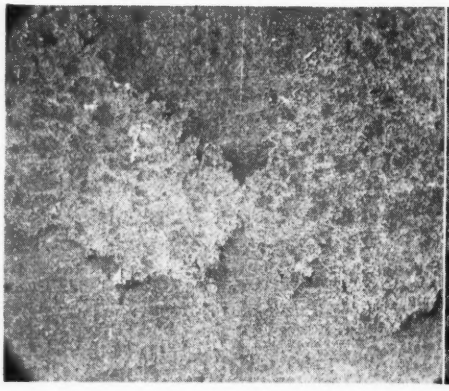
By Wallace G. Imhoff

President, The Wallace G. Imhoff Co., Vineland, N. J.

MANY statements have appeared from time to time in the technical trade journals in regard to the alloy bond, or contact zone between the zinc coating and the base metal. Some very careful studies of this contact zone reveal some very interesting and practical facts.

Attention is called at this point to the paper, "The diffusion of Zinc and Iron at Temperatures Below the Melting Point of Zinc", in the "Journal of the Institute of Metals", Vol. LIV, No. 1, 1934, by Gilbert Rigg. This paper is so important at this time that the following synopsis is given:

"When clean rolled zinc sheet is heated in close contact with clean iron diffusion commences at below 300 degrees C. (572 degrees F.) and is fairly rapid at above 830 degrees C. (716 degrees F.); it proceeds by the formation of cones of diffusion products which spread out from isolated points where the contact between the metals is most perfect, and gradually penetrate into the zinc and across its surface. The progress of the diffusion is governed to a large extent by the nature and smoothness of the iron surface, and does not seem to be dependent on the vapor pressure of the zinc. Two well-defined layers of diffusion products are formed, a thin layer of constant thickness (about 0.08 mm.) containing about 17 per cent iron being next to the iron, and a thicker layer containing 0-11 per cent iron outside this. On continued heating, the thin layer moves towards the zinc, being continuously converted into the zinc-rich layer; this would



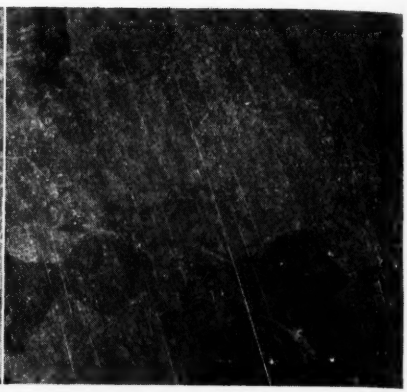


Fig. 1—(Left)—Diffusion of iron and zinc at 800 deg. F. (427 deg. C.). Magnification, 36 diameters. Fig. 2—(Right)—Diffusion of iron and zinc at 850 deg. F. (455 deg. C.). Magnification. 36 diameters.

seem to indicate that the principal diffusing constituent is the iron. The rate of penetration depends on the time and the temperature, and is independent of the grade of zinc, but the thickness of the zinc-rich layer is less with electrolytic zinc than with pure zinc. The mechanism of the diffusion process is discussed."

This paper is well illustrated and extremely valuable in understanding what goes on at the contact zone between an iron sheet and zinc, **Below the Melting Point of Zinc.**

Diffusion of Zinc and Iron at Temperatures Above the Melting Point of Zinc.

The results herein submitted were obtained when a steel sheet was kept in molten zinc baths from a temperature of 800 degrees F. to 1300 degrees F., tests being made every 50 degrees. The zinc melt was raised to the required temperature, heated for 6 hours, and then the melt with the sheet in it was allowed to freeze in the furnace over night. The melts were then removed, and the contact zone between the iron sheet and the molten zinc was examined under the microscope.

Diffusion Plainly Visible at 800 Degrees F. (427 Degrees C.)

The alloying action, or diffusion of the zinc and iron are very plainly seen in Fig. 1. Two very large areas of zinc-iron alloy extend from the outer edges of the field of the illustration down into the middle. The outlines of the areas of diffusion do not show any regular form of crystallization, although dross, the zinc-iron alloy formed in galvanizing baths belongs to the hexagonal system. The forces of crystallization have, however, developed hexagonal outlines inside the diffusion areas. Most of the diffusion alloy however is non-crystalline in character.

Diffusion at 850 Degrees F. (455 Degrees C.)

The distinct tendency to form hexagonal crystals of zinc-iron alloy are plainly visible in Fig. 2, which shows the results of the contact between the iron sheet and the molten zinc at a bath temperature of 850 degrees F. It will be seen in the illustration that the outlines of the large dark areas tend to be six-sided figures. Zinc-iron alloy is also found between the boundaries of these crystals.

Diffusion at 900 Degrees F. (483 Degrees C.)

The diffusion at 900 Degrees F. reveals a very decided alloying action of the iron with the zinc. The contact area is very clearly shown in Fig. 3. The heavy dark area at the left is the iron sheet; the narrow light zone through the middle of the illustration is the contact zone and the area at the extreme right is the zinc area filled with very dark zinc-iron alloy crystals. This illustration very clearly shows the iron breaking up into cakes and floating off into the molten zinc where it finally is dissolved or diffuses completely in the zinc. It unmistakably shows the penetrating power of molten zinc into iron. Attention is also called to violent penetrating action of the molten zinc at 900 Degrees F. Comparing Fig. 3 with Figs. 1 and 2 very clearly shows that diffusion is very light at both 800 and 850 degrees F., while at 900 degrees F. the diffusion, or alloying action becomes distinctly rapid.

Diffusion at 950 Degrees F. (510 Degrees C.)

Much has been said from time to time of the alloy bond, or contact zone between the iron and zinc. Figure 4 is a perfect view right in this alloy bond, or contact zone. It is extremely interesting because neither the iron sheet nor the zinc bath are visible; it represents a clear section right through the contact zone when the zinc bath was held at 950 degrees F.

As would be expected, this contact zone is made up completely of zinc-iron alloy and undigested fragments of iron dissolved loose from the iron sheet. The diffusion seems to be a distinct parallel to the dissolving up of ice from a pond in warm weather. First there is the solid layer of ice over the water; then as the dissolving forces set in, the solid ice breaks up into small ice cakes which float in the water, and are finally dissolved by the water.

The destruction of the ironsheet in the zinc follows exactly the same method of diffusion; first the penetration of the zinc into the iron; next the breaking up of the iron into iron-cakes; next the dissolving up of the iron cakes in the molten zinc bath first to form zinc-iron alloy, and finally when it becomes saturated with iron

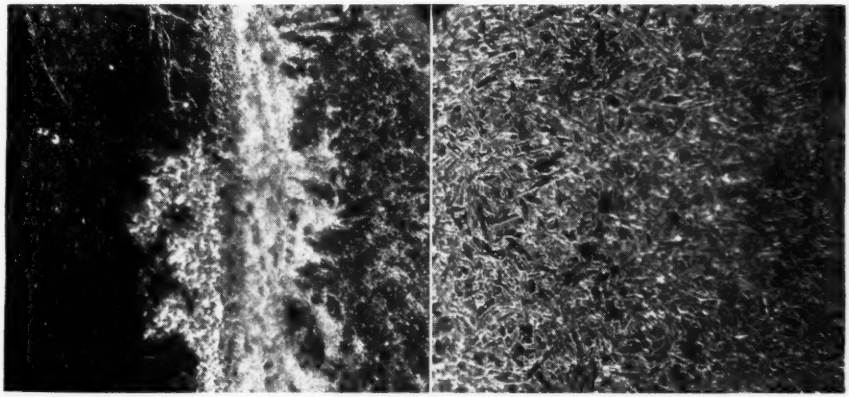


Fig. 3—(Left)—Diffusion of iron and zinc at 900 deg. F. (483 deg. C.). Magnification, 36 diameters. Fig. 4—(Right)—Diffusion of iron and zinc at 950 deg. F. (510 deg. C.). Magnification, 36 diameters.

to form zinc-iron alloy crystals (dross crystals).

Diffusion at 1000 Degrees F. (538 Degress C.)

The extremely violent penetration of the molten zinc into the iron sheet can be seen in Fig. 5. Here the breaking up of the iron into iron-cakes can be very plainly seen. The very dark area on the left is the iron sheet; the dark fragment area in the middle and to the right is the iron-cake area in which the fragments of iron, have been floated loose from the main iron sheet; and finally the very light area at the extreme right is the molten zinc bath. It will be noted that this zinc bath really extends clear to the middle of the illustration as shown by the very light line down through the center. The mechanism of the diffusion is shown very clearly in this illustration. First the penetration of the zinc into the iron sheet which floats off, or loosens iron-cakes that float off out into the zinc bath where they are finally dissolved entirely by the molten zinc. The contact zone in Fig 5 is shown by the iron-cake area at the center and to the right.

Diffusion at 1100 Degrees F. (594 Degrees C.)

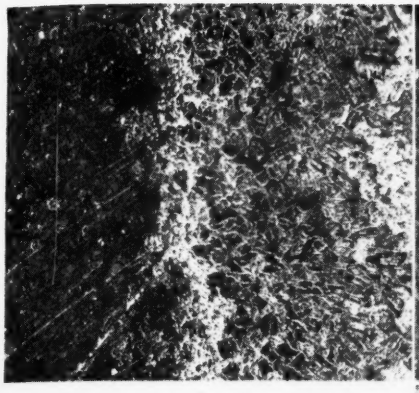
The contact zone at 1100 degrees F. is shown very plainly in Fig. 6. Here again the black area at the left represents the iron sheet, while the entire area at the right represents the contact zone. The iron-cakes are again to be seen, and by looking closely at the dark area in the iron sheet, especially at the bottom, the penetration of the molten zinc into the iron sheet can be seen by the light gray spots or areas in this solid black part. The dividing line between the iron sheet and the contact zone is a sharp one, as shown by the distinct line down through the center of the field dividing the black area from the iron-cake area.

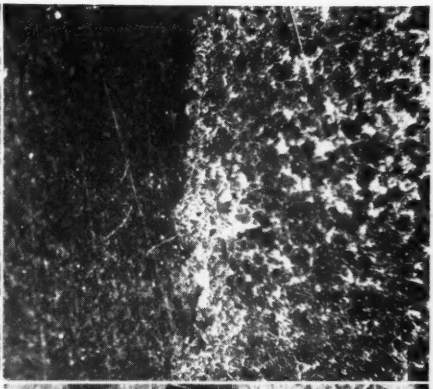
Diffusion at 1300 Degrees F. (705 Degrees C.)

The powerful alloying properties of the molten zinc with the iron sheet are perhaps the most vividly seen at the temperature of 1300 Degrees F.; far above any galvanizing bath temperature. However it is of special practical interest to discuss what has happened at such a high temperature. First it may be clearly seen that the iron sheet has been entirely dissolved up and there is no black area at all representing the iron sheet. The second vital thing to be seen in Fig. 7 is that the crystallizing forces have been strong enough to form irregular hexagonal zinc-iron alloy crystals. These may be plainly seen in the six-sided figures at the lower right of the field of vision. The light area is the molten zinc bath and in this case there is no contact zone as the iron sheet has been entirely dissolved up and is in the form of iron fragments, and hexagonal zinc-iron alloy crystals in the bath. These crystals can be plainly seen in Fig. 7.

A complete summary therefore of a tudy of the contact zone between an ron sheet and a molten zinc bath at lifferent temperatures reveals—

1. That diffusion of the iron into the zinc occurs at 800 degrees F.
2. That the diffusion of the zinc and the iron forms an iron-zinc alloy.
3. That the forces of crystallization may be recognized at a bath temperature of 850 degrees F.
4. That the iron-zinc alloy tends to assume a hexagonal crystal form.
5. That extremely violent destruction of the iron sheet takes place at 900 degrees F.; a sharp contrast to the alloying, or diffusion action on the iron sheet below 900 degrees F.





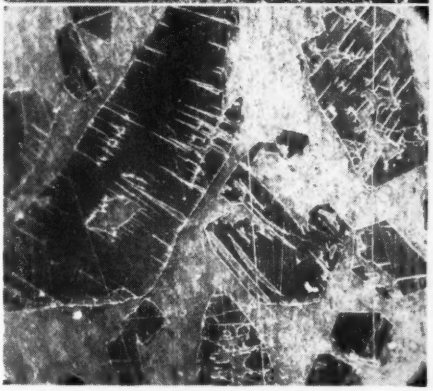


Fig. 5—(Above)—Diffusion of iron and zinc at 1000 deg. F. (538 deg. C.). Magnification, 36 diameters. Fig. 6—(Above right))—Diffusion of iron and zinc at 1100 deg. F. (594 deg. C.). Magnification, 36 diameters. Fig. 7—(Right) —Diffusion of iron and zinc at 1300 deg. F. (705 deg. C.). Magnification, 36 diameters.

6. That at 950 degrees F. the diffusion is not only very rapid, but forms a distinct contact zone of iron-cake fragments, and iron-zinc alloy crystals.
7. That the mechanism of destruction is similar to the breaking up of an ordinary ice pond—namely, first the penetration of the zinc into the iron sheet loosening and floating off fragments of iron-cakes into the zinc bath, which eventually dissolves entirely in the zinc to form zinc-iron alloy.
8. The zone of contact consists of iron-cake fragments and iron-zinc alloy crystals.
9. That the iron-zinc alloy crystals are hexagonal in shape, six-sided figures, and the crystals belong to the hexagonal system.
10. That at high temperatures the iron sheet will dissolve completely if the time is long enough, and that the sheet will first go into solution as iron-zinc alloy, and then when the bath becomes saturated separate out as hexagonal zinc-iron alloy crystals.
11. That diffusion, or assimilation is accomplished first by the iron breaking up and dissolving into the zinc bath contaminating it with iron and forming an iron-zinc alloy of very low iron content. Finally, the saturation of the bath becomes high enough that in order not to stop the diffusion or alloying action on the iron sheet, the excess iron in the zinc bath separates out as zinc-iron alloy hexagonal crystals. In commercial galvanizing these crystals are known as dross.
12. The contact zone, or alloy bond

may therefore be described as follows—first, the iron sheet, then the contact zone of iron-cake fragments and zinc-iron alloy crystals, and finally the outside, or purer zinc which is the top, or zinc coating.

"The Parkerizer". A four-page folder devoted to scientific rust prevention known as "The Parkerizer" is being issued by Parker Rust-Proof Company, 2172 E. Milwaukee Ave., Detroit, Mich. The practical applications of the Parker processes are described and illustrated in this folder. Copies of "The Parkerizer" will be sent to those individuals who write to the Parker Rust-Proof Company, 2172 E. Milwaukee Ave., Detroit, Mich.

Lee Direct Fired Unit Heater. Industrial buildings require heat for a relatively short time each year and the cost of fuel for line losses and for maintaining steam pressure to prevent freezing is sometimes greater than the cost of fuel actually delivered as heat. The complexity and high operating cost of steam systems and resulting low efficiency have in the past been largely unavoidable. The ideal heating plant is one that would deliver to the desired locations every heat unit originally contained in the fuel. According to the text matter contained in a catalog which is now being distributed by Dravo Corporation, Machinery Division, Pittsburgh, Pa., the Lee Direct Fired Unit Heater system is a close approach to such an ideal for large buildings such as factories, warehouses, steel plants, garages, and so on.

This catalog contains 20 pages of description of the Lee unit. The text is profusely illustrated with photographs, phantom views, and drawings showing the different types and sizes of units for use under various conditions, and data and specifications are included which will aid the prospective user to select the type which will best fit his needs. Copy of the catalog free upon request.

"Tri-Con Pressure Booster Nozzle". This is the title of a folder describing and illustrating the Tri-Con No. 400 Pressure Booster which is now being issued by Molded Specialties Company, 4712 Chester Ave., Cleveland, Ohio. The Tri-Con Pressure Booster Nozzle can be connected quickly and easily to an ordinary water and air hose for use in air drying, degreasing, and flushing work. Both water and air control are located at the nozzle. By reversing the Tri-Con patented cap a full spray for rinsing can be obtained.

The remarkable performance of the Tri-Con Booster Nozzle is said to be made possible by the use of a 37-hole Reversible High-Velocity Cap. The patented Tri-Con Water-Flow Control is said to eliminate jumping or chattering when water valve is opened. The water valve closes instantly when the finger is removed from trigger handle.

Copy free upon request.

Eastern Portable Mixers. The Eastern Engineering Company, 45 Fox St., New Haven, Conn., is now issuing a 12-page booklet describing and illustrating Eastern Portable Mixers.

With the exception of their laboratory and medium duty mixer line, all models are powered with heavy duty, low temperature rise motors which are built especially for the job they must perform. Standard models are equipped with splash-proof and drip-proof motor end covers. For use in the presence of corrosive fumes, totally enclosed motors are available, and for use in the presence of inflammable vapors or gases, explosion-proof motors are available.

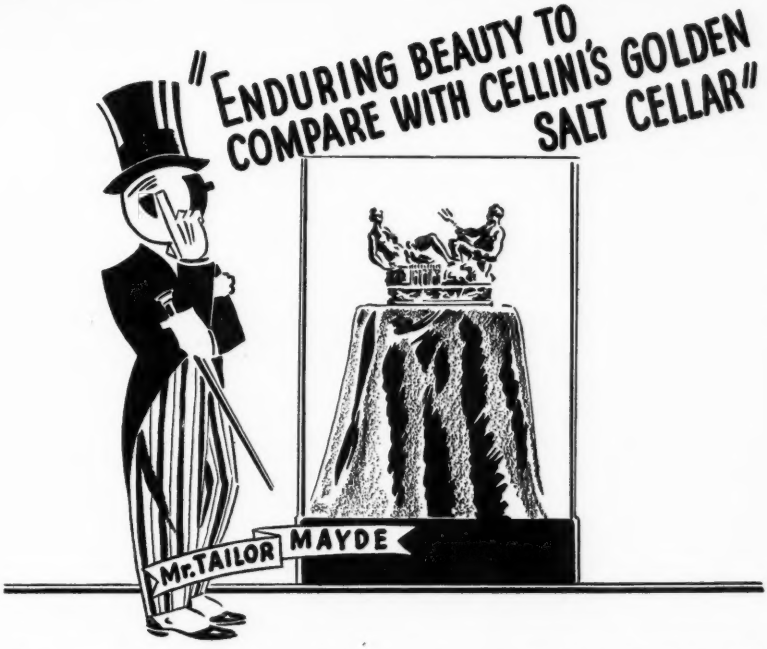
The standard industrial models are equipped with sleeve bearing motors, but all models are available with ball bearings if desired. The geared head models come with ball bearing motors only.

Propeller shafts are supplied in 18-8 stainless steel on all standard models. Monel metal, Tobin bronze, and other alloys are available where necessary. The propellors used on the standard models are of special design. The amount of power obtained, due to the special design, is said to give a strong and effective mixing action.

A copy of "Eastern Portable Mixers" will be sent free upon request.

"Buff and Composition Bulletin No. BC-104." This is the title of a bulletin which has been recently published by the Hanson-Van Winkle-Munning Co., Matawan, N. J. Pictures of the various types of buffs and compositions, plus a description of their uses, are included in this bulletin. Copy free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.



Four centuries ago . . . to please the whim of Francis I of France . . . Benvenuto Cellini fashioned in purest gold, a magnificent salt cellar. To this day it remains the finest example of the art of goldsmithing . . . a perfect specimen of beauty that endures.

But the famous Florentine would be astounded to see how present-day manufacturers of the most prosaic products seek these same qualities—beauty and durability—formerly reserved for the arts. For example take the manufacturers of metal articles. They know the sales value of an attractive finish that can "take it" . . . they demand tough, beautiful A & W "Tailor-Made" Finishes.

Poor lacquers or enamels mean more rejects . . . jam up your production line . . . eat into your profits. Take no more chances. Call in the A & W representative and have him develop for you an A & W Finish that is specifically designed—"Tailor-Made" —for your needs.

AULT & WIBORG CORPORATION

NEW YORK, N.Y. CINCINNATI, OHIO

HIC ET UBIQUE

Builders of Fine Industrial Finishes

Color In Metal Finishes as A Sales Factor

By Lawrence Blazey
Designers for Industry, Inc., Cleveland, Ohio

DOUBTFUL it is whether there be a product that minus color or finish, would find ready sales. Even the lowly pick and shovel must incorporate appearance value, otherwise their movement in a highly competitive market would be slowed down regardless of quality.

Appropriate color or fine finish imparts what, in many instances, is the primary sales appeal and combines with design-style to constitute a most powerful sales stimulant. Serviceability of finish is also vital, for finish must adequately protect the product and stand up well. Another factor in color use is found in what may be termed its structural values, for color may be used to emphasize or minimize the size and shape of a thing.

This may seem elementary, yet today business is being lost by many manufacturers because of lack of misunderstanding of color as a sales factor, as well as the advantages it confers as a medium for effecting variety and change in products, without extra cost. Its proper use to impart a feeling of quality has been ignored. as has been the fact that masses, classes and nations are color conscious and have decided color preferences.

Color first came into general product use about a quarter of a century ago. It proved a sales booster of the first water, and as manufacturers recklessly strove to apply color, their excesses and distasteful uses brought about a reaction, for not only were colors inappropriately used, but in many cases tended to hide other points of beauty and sales appeal.

But color on functional things is again coming into its rightful place, for students of color and color psychology have learned how to use color and finish sanely and effectively, and alert manufacturers are capitalizing upon color to stimulate markets and to develop new ones.

The universal desire for things appropriately colored is well demonstrated, say in the motor car field. Trucks, passenger cars and trailers are as varied in color as the flags of nations. In passenger cars, the dark tones predominate although an almost unlimited assortment of vivid colors is used in decorating trucks and light delivery cars. However, color values in motor cars are not necessarily an indicia of appropriate color values for other products.

Selection of the right color for many products is not a simple thing. With few product exceptions, there is neither tradition nor standard to dictate color uses. In the majority of things, appearance values begot of color are in a constant state of flux, ever changing with styles, fads and fancies, and use association. About the only color modes that seem to adhere to monotonous standard are box car red, gondola black, industrial gray and the red signs on chain stores.

In the few instances where colors and finishes have been long standard-

ized, the selection, as in the case of railroad equipment, is empirical, based on the utility of certain colors to give best services under conditions of dirt, grime and hard usage, plus low maintenance cost. Likewise, in the heavy duty and equipment fields, black has long been commonplace, but even in these things manufacturers are slowly learning that color lends appearance value, and color and attractive finish are becoming commonplace.

In general, however, in the fields of equipment, tools and furnishings, color standards are practically nil. An outstanding exception is found in the house furnishing field where representatives of the trade collaborated with the U. S. Bureau of Standards in establishing "official" colors for kitchen and bathroom accessories. For the former, white, green, ivory, delphinium blue, royal blue, and red, were adopted; and, white, green, orchid, ivory, maize, blue, and royal, were approved for bathroom accessories. The selection of these colors does not mean that their use is mandatory, though it is hoped that manufacturers will include these shades in most of their lines.

In other home equipment and furnishings, color selection is largely a matter of preference, color relationships, association and style. Undoubtedly it would be difficult to market a mechanical refrigerator in any other color than white though a variety of attractive finishes are available. Usually tables, utensils and cabinets are selected to harmonize with kitchen or bathroom schemes.

In the office equipment field, greens, browns, and mahogany in smooth finish have long featured office cabinets, files and other equipment and on the whole, so far as metal office equipment is concerned, there is a discordant note both in finish and design. Unquestionably there would be more office modernization programs and consequent sales of new equipment were manufacturers to give heed to inherent human desire for beauty and harmony in places of business as well as in the home or places of entertainment. Durability of new paints, lacquers, enamels and other materials in various finishes has been demonstrated, and there is wide opportunity for their injection in office equipment styles.

New processes have been evolved for coloring metals without the use of pigments or dies, in a variety of smart lustrous or egg-shell finishes. Likewise stainless steel is available in various colors, thus giving sparkling, smart color in that material. These innovations have made available new sales appeal in a variety of things from household things to machinery, tools and office appliances.

As has been strongly emphasized by merchandising experts, the use of appropriate color is relative in importance to good design proportions, and from the standpoint of sales appeal often carries more weight than the service performance of the product.

Selection of color is contingent upon three factors: namely, popular color styles and fads, use and service requirements, and tradition or use association as in the case of sanitary or food equipment. And then there is a fourth and quite important use, namely, to effect optical illusions, soften lines, or create contrasts — its structural values.

Color may be used to emphasize or imply certain features without actual physical changes in a product. This is demonstrated by the use of color combinations to make an object appear to be streamlined. An unbalanced object can be made to appear balanced. Attention can be attracted to a part of a product to the extent that a prospect fails to notice any unattractive features. Old products can be dressed up and so changed as

to give them a bright new appearance.

Most finishers are familiar with the use of horizontal and vertical lines to effect an illusion of length or breadth, the use of different line termini to give illusion or length or shortness, and the simulation of convergent or divergent effects by short lines crossing parallels at an acute angle. Contrasts and desired optical illusions are also obtained by the use of tone contrasts — for instance, a white patch on a black background looks brighter than when surrounded by gray, and the white accentuates the darkness of the black patch.

Color can be divided into three classifications, namely, full-intensity, tints, and shades. Full-intensity colors are those most familiar to the layman who expresses color preferences in the following order — red, green, blue, yellow, brown, black and white.

Full-intensity implies maximum power of brilliance. Tints are evolved by adding white to full-intensity colors, consequently hundreds of variations are possible. Shades are developed by adding black to full-intensity color, with almost unlimited gradations.

The artist-designer through technical understanding of color values and experience, has been able to combine the more subtle color variations in effecting balanced color values. For instance, he understands the value of a grayed tone to over-emphasize a brilliant color or he may effect a color cast over another color by introducing a complement. The effective use of these subtle shades commands a thorough knowledge of color values and is hardly within the province of the layman. One of the grave errors in product coloring lies in placing the responsibility for finish and color selection upon persons who feel that colors should be bright and shrieking, whereas the reverse color policy is often more practical in effecting maximum appearance values.

The use of black or white on products deserves consideration from many angles. Technically, black and white are achromatous; they are not colors and primarily are indicia of light intensities, where a factor of delicate sensitivity to heat is involved, black or white must be used with understanding, for black objects absorb heat and white ones reradiate heat. These things are merely mentioned to emphasize the delicate technique that sometimes enters into the use of color finishes.

Again, the color artist also employs color psychology according to nature or function of a product, and the persons using it. He bases his color selection on known mental reactions to colors, not overlooking the factor of color sensibilities created by fashion and tradition. For example, the average man or woman likes red or blue better than orange; pink or pale blue are preferred for children's things; there is an almost unshakable preference for white where foods, sanitation and asepsis are involved; and color selection may be dictated by the desire to make a product appear large or small, dainty or rugged.

Obtaining maximum appearance value through color is a highly developed art. Properly used, color will perform sales miracles; improperly used, it will hamper sales regardless of other qualities of the product.

"Pertinent Questions and Answers Concerning Dusts." This is the title of a 16-page booklet which is now being issued by the Mine Safety Appliances Company, Braddock, Thomas & Meade Sts., Pittsburgh, Pa. This booklet endeavors to answer some of the important questions that arise continuously regarding the nature and effects of dust, in simple and in so far as possible, non-technical language. Copy free upon request.

Mention PRODUCTS FINISHING when writing to advertisers.

A STAR *Surface* PERFORMER

A SUCCESSFUL hockey player must be more than just a star surface performer . . . In addition to grace and flexibility, it is necessary for him to have stamina and the ability to cover a lot of territory.

So it is with industrial finishes . . . They must be star surface performers in more than mere beauty of finish . . . They must be flexible and possess durability and they must "cover a lot of territory."

EGYPTIAN Lacquers and Synthetics are stars in the true sense of the word . . . They are designed not only for beauty of surface finish but for durability and coverage as well . . . All EGYPTIAN Finishes are formulated to give a maximum of service whether they are to be used on the cheapest of toys or the finest of furniture.

There are hundreds of standard EGYPTIAN Finishes from which to choose the proper one for your product but if perchance your requirements are so unusual that a standard material will not solve your problem, our completely equipped laboratory will be glad to assist you in working out a special material to fit your individual needs.

EGYPTIAN SUPERIOR LACQUERS

THE EGYPTIAN LACQUER MFG. CO.

LACQUERS · SYNTHETICS · PAINTS · VARNISHES

ROCKEFELLER CENTER · NEW YORK, N.Y.

Heating Corrosive Liquids

By Carl E. Heil

President, Heil and Company, Cleveland, Ohio

MANY chemical reactions are induced or accelerated by the application of heat. In industrial processes, the methods used for introducing heat into a tank often present difficult problems due to the corrosive action of the solution on the heating device or tank equipment. In this article, only subject matter pertaining to metal finishing plants is discussed.

Steam Jets

Pickling is one of the most common methods of cleaning steel preparatory to metal coating, enameling, painting, and so on. The heating of pickling tanks in large installations is carried out with steam jets or injectors. These devices introduce live or exhaust steam directly into the bath and furnish an economical source of heat for any chemical bath. The condensed steam can be utilized to compensate for the "drag out" of solution when pickled articles are taken from the tank. Steam jets must be of rugged construction in order to withstand mechanical abuse, as well as of superior resistance to acid attack, in order to give satisfactory service. The nozzle of the jet should be directed towards the center of the tank, away from the walls and bottom, otherwise the scorifying action of the steam is likely to erode and damage the tank equipment.

An advantage of the jet system is that it serves to agitate the solution as well as heat it, and jets should be so placed that maximum effectiveness is obtained in this direction. Because of their chemical inertness to most industrial solutions, lead jets are generally used. They have, for instance, proved very durable in sulphuric acid pickle. The material used for protective purposes will naturally vary according to the nature of the solution. For handling stainless steel pickles, which may include nitric, hydrofluoric and hydrochloric acids, lead would not be suitable and the writer has found that jets made of "Nocorodal," an impervious non-metallic carbonaceous material, show excellent life in steel production plants.

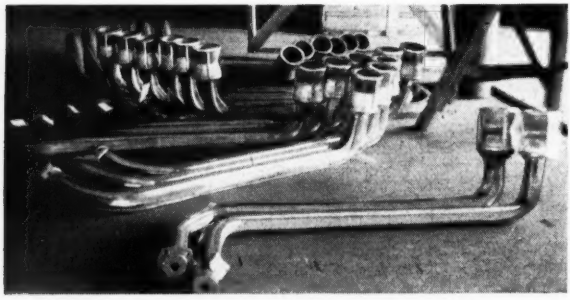


Fig. 1—Typical steam jets for tank heating.

Coils

For heating alkali cleaners, small acid picklers, plating solutions, coloring treatments, and so on, the most general way of heating is by steam, hot water or hot solu-

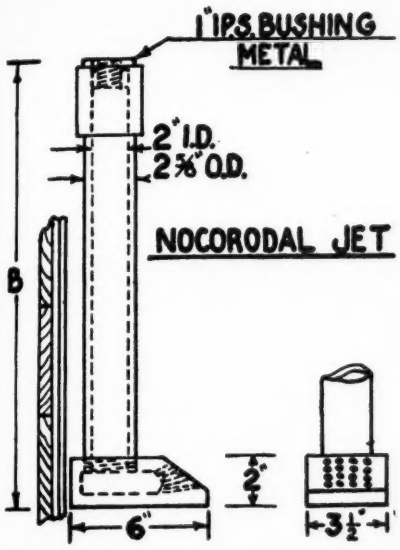


Fig. 2—Illustration showing method of installing Nocorodal type steam jet.

tion, which is passed through coils located in the tank or in an outside circulating system. lead piping or lead-coated piping is generally used for acid pickles, and nickel and chrome plating tanks. For hot rinses, alkali cleaners, and so on, iron piping is most frequently employed. For coloring treatments, monel metal and stainless steel are sometimes used.

It is usually desirable to erect the coils in a flat framework with hangers to hang on the sides or the ends of the tank. They can thus be readily lifted out whenever it is necessary to clean sludge from the bottom. Furthermore, convectional currents do not stir up and cloud the bath. Better heat transfer is effected when the coils are free from collected bottom sediment.

Gas Heating

Where steam is not available at low cost, or where the demand is not great enough to warrant the initial investment in a boiler and the necessary piping, the use of gas provides a low-cost installation, as well as simple operation. The "gas-immersion" system, in which the heat of the burners is made to pass through a tube or tubes immersed in the solution itself, is very efficient and it is stated that a maximum rate of heat-transfer may be readily obtained. The immersed tubes or flues are of course made of resistant material such as steel, monel, lead, and so on, according to the nature of the solution.

Electric Heaters

Electric immersion heaters, suitably sheathed to combat corrosion effects,

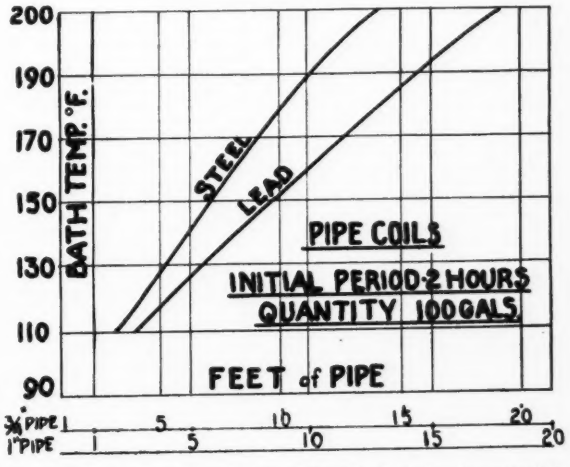


Fig. 3—Graph showing relation of length of piping immersed in tank solution to bath temperature for steel and lead piping respectively.

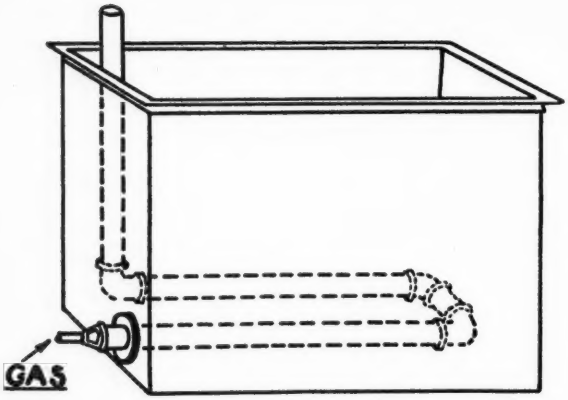


Fig. 4—Gas immersion heater shown in position installed in tank.

have found a very definite use in the metal finishing field. The units are easily portable and may be used interchangeably in several tanks. The electric units can also be operated and regulated by thermostatic or by remote control and are easily kept clean and require practically no maintenance. Furthermore, standard units can be installed singly or in multiples to meet varied demands, and these additions can be made at very little installation cost.

Other Heating Methods

Jacketed tanks and circulating or heat-exchange units are sometimes employed where unusually severe corrosion problems exist, or where inflammability, constant temperature, or faster heating must be considered.

A dependable heating system, carefully designed to suit the particular needs of the case, makes for more perfect processing and insures a uniformly-finished good product.

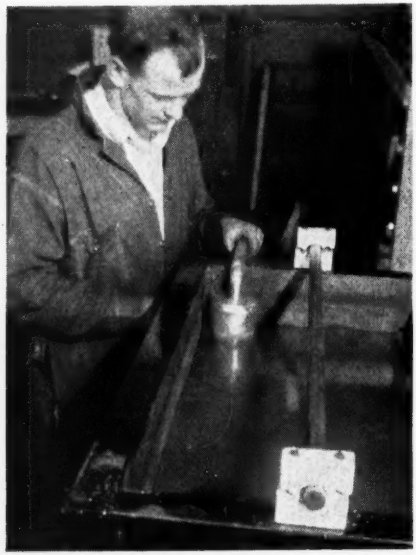


Fig. 5—Electric immersion type heater. In addition to regular heating work, such units may be usefully employed to speed up the initial heating period or to maintain temperature constant, by thermostatic or other control.

Century Direct Current Motors. The line of direct current motors in integral sizes from 1 to 300 h.p. built by Century Electric Company, 1806 Pine St., St. Louis, Mo., is described and illustrated in an eight-page folder now being issued by this company. The motors are adaptable for constant, adjustable and varying speed applications, and for continuous or intermittent service. Copy free upon request.

"Handle It Off the Floor" is the title of a bulletin which features P&H Hoists and illustrates many practical applications of these hoists in all branches of industry. Copy free by addressing Harnischfeger Corporation, 4535 W. National Ave., Milwaukee, Wisconsin.

Mention PRODUCTS FINISHING when writing to advertisers.

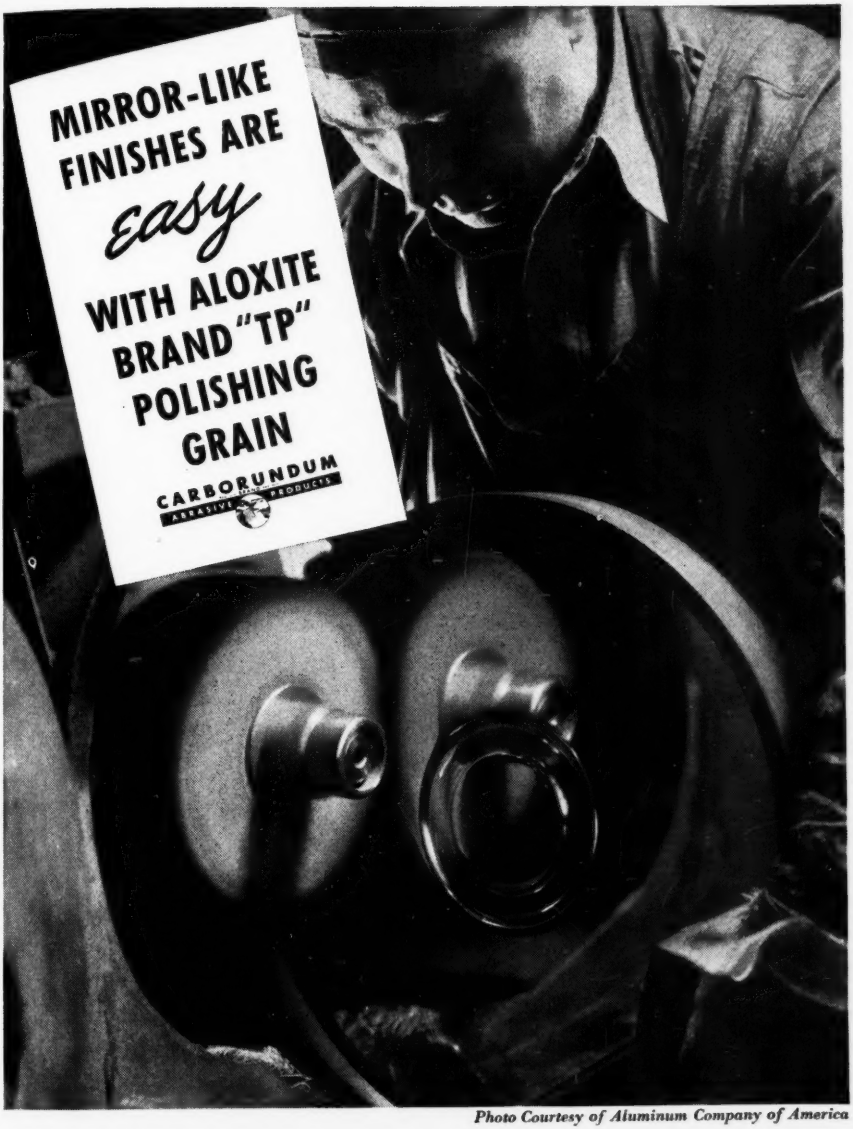


Photo Courtesy of Aluminum Company of America

THE CARBORUNDUM COMPANY • NIAGARA FALLS, N.Y.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum and Aloxite are registered trade-marks of The Carborundum Company)

Decorative Finishes for Zinc Alloy Die Castings

By R. E. Kellers

The New Jersey Zinc Company, New York, N. Y.

FROM time to time, new developments and trends in finishing zinc alloy die castings have been discussed, but the comments, for the most part, have been confined to the two most widely used methods: electroplated and lacquered or enameled coatings. More recently, however, there have been advancements in the field of plastic coatings and now there comes to light a new development in decorative finishing which cannot be classified with any of the above groups.

The Advanced Products Association has introduced a photo-lithographic, or decalcomania film process which, according to reports, has survived rigorous tests to determine toughness, durability and hardness. With this process, it is possible to produce attractive finishes to stimulate grained wood, marble and other surfaces that would be practically impossible with ordinary organic coatings and several of the attractive designs that are already available are illustrated herewith.

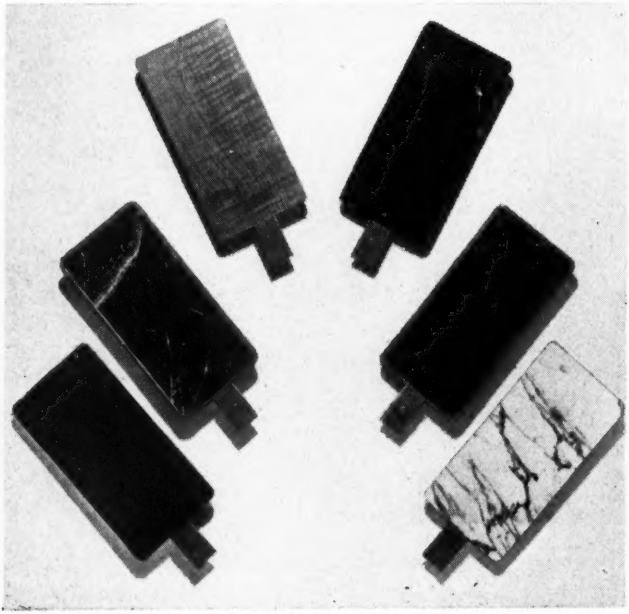


Fig. 1—Illustration showing several of the attractive wood grain and marble effects which are now possible for zinc alloy die castings.

The procedure for applying the new finish to zinc alloy die castings is fairly simple. The casting, after being properly degreased, is given a phosphate type pretreatment which creates a chemical film to form a permanent an-

chorage for any organic coating. A subsequent spray application of a special synthetic baking enamel provides the proper background for the photolithographic film and may also serve as the color coat for the trim. After the necessary oven treatment, the film, which is composed of lacquer materials and is about .003 inch thick, is applied by the use of a mutual solvent cement, forming an inseparable bond with the synthetic coating. After further oven treatment, a final clear top coat of a satin finish or high gloss synthetic or a buffing lacquer is applied. If the later type of coating is used, the finish may be buffed to an exceptionally high lustre.

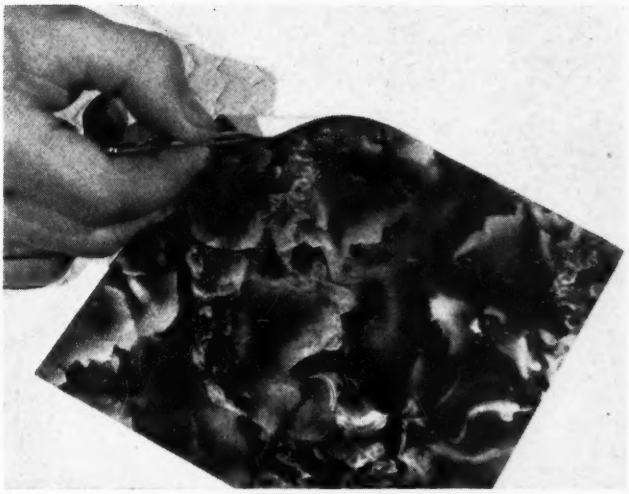


Fig. 2—The decalcomania film is composed of lacquer materials and is about .003 inch thick.

Many products on which this new type of finish is being used have been given service tests in humid and salt air atmospheres and it is reported that the film remained 100 per cent intact.

"How to Stop Corrosion". This is the title of a special folder which deals with a modern method of saving heavy losses from corrosion that is now being issued by Collord Inc., 7049 Lyndon Ave., Detroit, Michigan. This folder also gives information on how to successfully seal concrete surfaces against moisture and acids.

Copy free upon request.

"Neville Coal-Tar Products". This is the title of a condensed complete listing of Neville Coal-Tar Products, which is now being issued by The Neville Company, Neville Island, Pittsburgh, Pa., giving useful and pertinent data in a concise form under the headings: Synthetic Resins, Solvents, Plasticizing Oils, Oils, and Tar Products. On page 2 is a graphic derivation chart of coal by-products which has never before been published by this company. Valuable reference data is also made available in this folder. Copy free upon request.

Cadmium Water Dip Lacquer No. 3850 and Blue Knight Roxyn C. A product summary giving the properties of "Cadmium Water Dip Lacquer No. 3850" a clear, cellulose type air-drying lacquer which prevents the oxidation, fuming or marring of cadmium plate is now being issued by Roxalin Flexible Lacquer Co., Inc., Box 775, Elizabeth, New Jersey.

A product summary giving the properties of "Blue Knight Roxyn C" a synthetic type, air-drying or baking flexible lacquer, pigmented and clear, with resistance to perspiration and highly corrosive chemicals is also being issued by this company. Roxyn C is said to have high flexibility and adhesion and stand hard physical use without chipping, flaking, or peeling. Copy of these summaries will be sent free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

Barrel Finishing of Metal Products

Eleventh Article of Series—Additional Factors in the Use of Soap in the Barrel Finishing Process.

By H. Leroy Beaver

APPARENTLY from the number of inquiries we have received, it seems our previous paper on the subject, "The use of Soap in the Barrell Burnishing Process," was not sufficiently complete, for a preponderance of questions now ask for additional data on the following:

1. What causes water to be hard?
2. What effect does hard water have on soap?
3. How do you prepare the solution that you call "Standard Soap Solution?"
4. What is soap bark?
5. What is the product you called "soapless soap" composed of and how does it differ from regular soap?
6. What soap do you recommend for burnishing stainless steel parts?

We will endeavor to clarify the above by answering the questions in the order in which they are set down as follows:

1. Hard water is caused by the presence of soluble calcium and magnesium salts in the water. The calcium may be in the form of chloride or bicarbonate. Magnesium may be present as chloride, bicarbonate or sulphate.
2. When soap is added to hard water, the hardness of the water reacts with the soap to form sticky, insoluble hard water soap curds. As long as any hardness exists in the water one does not get any beneficial action from the soap. Therefore, enough soap must be added to the water to counteract all the hardness and to provide additional excess soap to give whatever action is required in the particular process in which the soap is used. The difficulty of using soap in hard water is not so much in the actual application for either cleaning or burnishing or a combination of these two operations, but rather in the rinsing process. During rinsing the active soap reacts with the hardness in the water to form the sticky hard water soaps which we just mentioned. These sticky curds of soap then become attached to the surface of the metal parts and very frequently give rise to trouble in subsequent operations.

It must be understood that as the hardness of the water increases, the amount of soap required to provide for the necessary lubrication in barrel burnishing, also increases. We know of some plants where they are operating satisfactorily even though their water supply runs as high as 15 to 25 grains hard, but this is done with a far greater soap consumption than if the water they use was first normalized and reduced to zero hard. Personally, our experience over a long period of years has been such that

where the water hardness exceeds from 5 to 7 grains, a water softener is not only necessary but most desirable.

The effect of hard water on soap may be readily seen by dissolving a quantity of soap in distilled water in a glass jar. The solution may be made up by placing from four to six ounces of soap flakes or chips into a quart jar, then filling the jar with cold distilled water, stirring the mixture occasionally until the soap is dissolved. Now, in using distilled water you will find that when the soap has dissolved there will be a layer of white sediment on the bottom of the jar. This sediment is not a filler or adulterant, but is merely the product of hydrolysis which will occur irrespective of the soap used.

Now if the same experiment is carried out using hard water instead of distilled water, when the solution is complete you will observe not only the layer of white sediment, the product of hydrolysis, but you will also observe that the layer of sediment on the bottom of the jar is much deeper than in the solution made with the distilled water. The large volume of sediment is due to hard water soap curds which will form and also settle to the bottom. If the water hardness is caused by calcium (lime), these hard water soap curds will be actually lime soap and this is the most tenacious and most difficult to remove. When lime soap deposits on the surface of metallic burnishing material, it most generally requires a refinishing operation with vienna lime at least to remove it and to reclaim the burnishing material for further satisfactory burnishing operation. If the operator desires to convert his dry soap into a liquid before placing it in the burnishing barrel he may do so (using 19 ounces of dry soap to each gallon of water stirring this until it goes into solution) and when the solution is completed the clear soap may be siphoned off and the sludge, the product of hydrolysis, may be discarded. If the sludge, however, also contains hard lime soap curds, then we most strongly would recommend the use of a water softener.

3. In a previous paper on the use of soap in the barrel burnishing process, we mentioned the Standard Soap Solution as universally used for determining the degree of water hardness, but we did not give the formula, assuming that any interested reader could secure the preparation locally. Apparently the assumption was in error and for that reason and for the benefit of many inquiring for it, we give the formula for the preparation of the Standard Soap Solution as follows:

Put 28.5 cc of a normal potassium hydroxide solution in a flask and add a few drops of phenolphthalein indicator. Now in a separate container dissolve 10 grams of oleic acid or a good grade of red oil in 75 ccs of neutral alcohol. Add this slowly, with agitation, to the potassium hydroxide solution until the pink color disappears, this indicating that all of the potash has been neutralized by the oleic acid. This mixture should then be diluted with 1000 cc of alcohol.

The strength of the Standard Soap Solution is such that 9 drops will give a stable suds in 50 ccs of zero soft water. Every 30 drops additional which are required to produce a stable suds indicates the water contains one grain of hardness per gallon. For example: 39 drops of standard soap solution indicates one grain of hardness; 69 drops 2 grains, 99 drops 3 grains, and so on.

Having determined the grain of hardness of the water, to eliminate it as far as possible without chemical or mechanical softeners, add one

ounce of tri sodium phosphate per grain of hardness per 100 gallons of water used.

Most industrial laboratories have the ingredients at hand for the preparation of Standard Soap Solution, but if you do not have access to such a laboratory, the solution can be compounded by any druggist.

4. We previously mentioned soap bark, and the question of what is soap bark and where is it produced now arises, and which we explain as follows:

The soap bark sometimes used in barrel finishing comes from the inner bark of a large tree called Quillaja Saponario which is native to Chile. It is also found in some parts of Central and in the northern part of South America. It is used in two ways. When in flake or chip form, it is best to first boil the chips in water using one pound of the chips to one gallon of water, boiling this down to two quarts of water then straining out the solution and discarding the chips. This solution may then be used in whatever proportion is necessary to secure the desired result. When reduced to a powder it may be added to the solution in the burnishing barrel after the powder has first been stirred into a small quantity of cold water. We personally prefer the solution rather than the powder form for the reason that with the solution there is no chance for the powder to form into a sludge which may deposit in small interstices of the parts being burnished where it is not readily rinsed out and where it may later cause trouble. The product is really not a soap, strictly speaking. It is so mild that it has quite a wide application for cleaning delicately colored fabrics, and we suppose the fact that it does produce a lather or suds was the factor that prompted its use in barrel burnishing. The lather which it forms is due to the presence of a glucoside saponin. Glucoside saponins have the general formula of $C_nH_{2n-8}O_{10}$. The detergent properties of soap bark lather are very feeble as is also its lubricating value. In some sections of the country where cream of tartar burnishing is used, soap bark is added to the cream of tartar solution, but we have never thus far been able to secure any logical explanation of why this is done.

5. In a previous paper we mentioned a comparatively new product which we called "soapless soap":

Soapless Soap so-called is made by the addition of hydrogen to already known vegetable oils, and whereby fatty alcohols become the end product of catalytic hydrogenation. These oils are changed into soapless soap by treatment with sulfuric acids. Perhaps the best known of the "soapless soaps" is a product called "Orvis". This is an almost pure white product which under normal temperature is of about the consistency of soft butter. This product when subjected to heat of from 90 to 100 degrees F, turns into an amber colored heavy oil. When added to water in the proportion of one ounce to a gallon of water it produces a cloudy solution, but if the container is placed in a warm water bath the solution rapidly becomes crystal clear. When we refer to the pH of soap for burnishing purposes, they will, as previously stated show an average of pH 10.2, but this soapless soap product will come very close to the normal pH of 7.

We have experimented with this class of material for barrel burnishing and while it does develop a profuse lather, it does not of itself provide as satisfactory a lubricant as what we have heretofore designated

LOOKING AT *Bonderizing* THROUGH A STEEL WINDOW

THE constant improvement of Parker Processes is extending their sphere of usefulness.

The recent adaptation of Bonderizing to the finishing of steel windows for the first time indicates the widening scope of this paint-holding and rust-inhibiting process. With this modern process, better paint adhesion and adequate protection from rust is provided with greater speed and economy.

Automobile bodies and other parts, as well as Washing Machines, Refrigerator and Air Conditioning Equipment, Office Machines and Electrical Devices are only a few of the scores of products on which greater assurance of finish permanence is provided by Bonderizing.

The manufacturer with a paint finishing problem should investigate the new effectiveness of Bonderizing on iron, steel or zinc surfaces.

PARKER RUST-PROOF COMPANY
2172 E. Milwaukee Ave.
Detroit, Michigan

Ask for These Books

For more than 22 years, this company has devoted its entire time, talent and energy to the improvement of rust-proofing methods. New books describing the Parker Processes are available to manufacturers and technical men. Send for your copies.

PARKER *Processes* **CONQUER RUST**
BONDERIZING • PARKERIZING

as a "hard tallow base soap". We do find however, that using the normal hard tallow soap in curd form that the rinsability is markedly improved by the addition of one ounce of Orvis soapless soap to each gallon of water used. As distinguished from other forms of soap generally used, this soapless soap does not hydrolize to give an alkaline reaction when added to water. From the experiments we have conducted as between soap bark either when used in powder or ground bark form or made into a concentrated solution by boiling, and the above described soapless soap, we much prefer the latter. It is far easier to manipulate, and while its first cost is fairly high when compared with the present price of market soaps (average cost of soapless soap ranges from 28 cents to 30 cents per pound) it will function more satisfactorily. Due to its remarkable free rinsing properties, we believe that soapless soap may become a valuable factor in connection with processes of metal cleaning, and we understand that considerable research is now in progress along this line.

Everything else being equal, the lower the titre of a soap the more rapidly it goes into solution. The actual time required for complete solution will depend of course upon such factors as temperature of the water, amount of agitation and thickness of the soap chip or flake or density of the curd form of soap. The character of the lather produced by any soap is almost entirely dependent upon the fat stocks from which the soap is made. For example high titered soaps such as tallow, tend to form thick heavy or creamy suds or lather. This is undoubtedly due to the fact that they form a thick soap bubble film, which might be comparable to the oil film on which a shaft is carried in a bearing, as the soap film relates to lubrication between the burnishing material and the parts in the barrel burnishing process. Low titered soaps, on the other hand, form thinner, more flexible soap bubble films, hence, a lighter and more frothy lather. In our opinion, the actual lather has little if any effect upon the performance of the soap as incorporated in the barrel burnishing solution, because the lather rides on top of the burnishing mass while the main lubrication body of the soap is carried within the burnishing mass itself.

6. What soap do we recommend for burnishing stainless steel parts, such as stampings?

To answer this question perhaps we should examine for a moment and consider that what is generally referred to as "stainless steel" may be any one of several of the corrosion resistant alloys which contain iron, chromium and sometimes nickel and known variously as Krupp alloy, Allegheny Metal and many other names, but all containing chromium and running from 12 to 28 per cent, and some also containing nickel up to 25 per cent. The most popular we believe being the 18 per cent chromium content metal.

All of these stainless alloys are infinitely harder than the conventional carbon steel from which stampings are generally formed, and for this reason they do not so readily respond to barrel burnishing practice as do the softer materials. Even when finished and colored on cotton buff wheels, parts made from these stainless materials require harder and faster cutting abrasives than are generally used on the average of steel parts.

The material, as other steels, is formed into billets and then rolled into sheets, being annealed between rollings. The final rolling which gives what is called No. 1 finish is not sat-

isfactory for the making of parts that are to be subsequently barrel burnished. The strip should be buffed on automatic machines to a smooth bright finish. If the parts are to have only one exposed side, then only one surface need be polished in this way, but if both sides are exposed then both sides of the metal should be polished and this before forming. We believe the general practice is to give the final finish with set up wheels or belts using 180 to 220 alumina or f or f2 powder. Even in the stamping and forming operations this finish is dulled and we cannot, as a rule, secure satisfactory finishes by the barrel method where we use simply steel burnishing material with soapy water as a lubricant. We therefore turn to another process not previously described in any of the papers in this series. For operating parts made from stainless steel or stainless iron we use a cast iron or steel sheet barrel shell unlined. Polished steel burnishing material is used in the same manner and in the same proportions as we use them for barrel burnishing, but instead of using soap the water should be measured when placed in the barrel, the quantity brought just to the surface of the mass of burnishing material, and then for each gallon of water in the barrel we add one and one-half pounds of Vienna Lime. At first this will tend to form a milky watery solution but as the lime particles become saturated they swell and the solution thickens and also in the final slaking of the lime considerable heat is generated. For this reason, any barrel or barrels used for this operation should be vented and care should be taken to see to it that the vent is open and kept open. The barrel may be operated at the same speed as for regular burnishing but the time required will be longer. On the average part we find that we can secure most satisfactory finishes by the removal of from .00015 in. to .0002 in. of the surface and as Vienna Lime is a soft polishing abrasive the running time to remove this amount of surface will be anywhere from 24 to 36 hours, depending on the alloy and its hardness.

A barrel of the high and narrow type is, of course, much to be preferred for this work due to the fact that with this type of barrel we can secure greater load concentration and a faster action. Barrels of this type generally have two openings on the periphery, and when the operation is completed, the one opening should be covered with a screen and then this screen turned downward toward the drain, then the top cover plate is removed and the lime is flushed from the barrel with hot water until the water runs perfectly clear. The lids are then replaced but a charge of regular burnishing soap is added to the mass within the barrel and it is given a run of nominally twenty minutes which is more of a washing than a burnishing operation, after which the parts are removed from the barrel and dried and buffed in the conventional oblique tilting type barrel with wood instead of iron or steel barrel shell and using vegetable fibre, cellulose meal or cob meal. The parts should be dried just as quickly as possible as this prevents any staining, and the fiber meals referred to are far faster in their moisture absorption properties than is the average sawdust generally used for drying out after the burnishing operation.

There are several makes and grades of Vienna Lime on the market which are variously effective and some of them may require more than the quantity specified. Should any reader desire the name of the particular Vienna Lime that we use in our research work, and that we have found to be the finest quality obtainable, the information will be gladly supplied by Products Finishing.

Composition of Modern Grinding Materials

In this article, the fundamental differences between sandstone or natural grindstones and the manufactured grinding wheel abrasives are explained.

By Henry R. Power
The Carborundum Company, Niagara Falls, N. Y.

THE attention that is being focused upon industrial dust by medical authorities, insurance hygienists and legislators has brought requests to the grinding wheel manufacturers for information regarding the composition of his products. It appears that in the forty years of grinding wheel manufacture from synthetic abrasives, the chemistry of the wheels has not been of paramount interest. This factor of neglect was due primarily to the fact that physical performance in grinding various metal products has always been the important unit of measurement used by the trade.

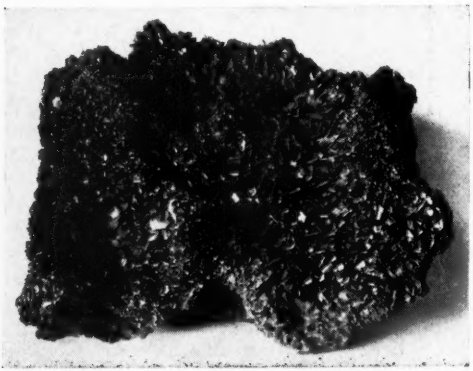


Fig. 1—This illustration shows a lump of silicon carbide. Silicon carbide is an electric furnace product used for making modern grinding wheels and surface coated abrasives.

A natural grindstone is made from certain sandstones which occur throughout the world and is composed of a grit that is quartz (pure silica) bonded or cemented by quartz itself with or without limonite in the more highly colored stones, clay, and calcite. Natural pulpstones, too, are sandstones for use in the manufacture of wood pulp and chemically, are also essentially free silica as sharp angular quartz, and must meet certain physical specifications such as hardness, toughness, and so on. These stones must also have a uniform resistance to a strain of 60 to 125 pounds per square inch. It has been stated that the natural deposits have been so long worked that the quality cannot be maintained. This situation has resulted in many complaints on performance of these natural products.

Buhrstones are essentially free silica too, slightly different from the grindstones, being chalcedonic silica and not quartz and probably formed by the precipitation of silica from solution. Buhrstones are fre-

quently used in grinding paint.

In contrast to natural free silica grinding wheels, the manufactured abrasive wheels may be, and very often are, absolutely free of free silica. The abrasives used are commercially electrically fused alumina sold under various trade names as Aloxite, which contains 95 per cent crystalline alumina (Al_2O_3), and a matrix of 5 per cent of titanites and silicates of iron and aluminum.

Another abrasive composed of silicon carbide is a chemical combination of silicon and carbon and is marketed under the trade name of Carborundum. This substance is nearly as hard as the diamond and has the chemical formula SiC. On the other hand, quartz or free silica referred to in the opening paragraphs is silicon and oxygen of the formula SiO_2, a very different substance.

In the manufactured abrasive wheel, the grit or abrasive is about 85 per cent and the balance is a bond designed to hold the abrasive granules together. The bond may be rubber, or resinoid, which is a synthetic resin for high speed grinding like cutting off or certain snagging operations.

Another bond used is a mixture of clay and feldspar which in the temperature of the pottery kiln forms a glass, which is an undercooled solution of silicates in which quartz or free silica are found in very negligible amounts. This product is known as vitrified bond. Each producer of manufactured grinding wheels has the facilities to provide the chemical characteristics of his particular wheels.

The use of manufactured abrasive wheels in place of natural sandstone wheels has been found to definitely reduce the silica content of industrial dust in grinding operations from upwards of 85 per cent free silica to a figure of a negligible amount, depending upon the type of wheel employed. This adds to the cleanliness and the general hygienic conditions of the plant in which this type of wheel is used.

Fig. 2—This illustration shows a lump of electrically fused alumina. This material is used for making grinding wheels and surface coated abrasives.

In making paint a high gloss red enamel that formerly required 22 milling hours between buhrstones is now run 14 to 16 hours with manufactured abrasive stones and has a maximum of gloss.

"F. W. B." This is the title of an 8 page catalog which is being issued by Everseal Manufacturing Co., Inc., Fisk Bldg., Broadway & 57th St., New York, N. Y., in which their line of modern industrial maintenance finishes are described. These finishes, said to be fortified with Bakelite resins, are available as follows: for floor finishes, aluminum exterior and interior finishes, heat resistant aluminum finishes, metal trim enamels, machinery enamels, heat resistant enamel, spar varnishes, and alcohol resistant varnishes. A description of each of these finishes and its application for industrial service is contained in this catalog. Copy free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

Sixteenth Exposition of Chemical Industries

FINAL plans are complete and all is in readiness for the 16th Exposition of Chemical Industries which will be held in Grand Central Palace in New York, during the week of December 6th to 11th, 1937. Awards for the best replies submitted in the contest to determine a slogan for the American chemical industry will be awarded at the Exposition on Monday evening, December 6th, at 8:00 P. M. In more ways than one, the week will mark a high point of technical interest. The dates of the Exposition coincide with those on which the American Society of Mechanical Engineers will hold their annual meeting in New York. The Chemical Exposition offers a great many exhibits which are of equal interest to chemical and mechanical engineers.

Raw materials, chemicals achieved by chemical synthesis, and finished products in the making of which chemical science has played the major role will be represented among the hundreds of exhibits. Synthetic organic chemicals will include thermoplastic cyclo-paraffin resins, coumarone-indene resins, cellulose acetate plastics, glyceryl stearate, glyceryl laurate, a chlorinated rubber base, synthetic resins of the alkyd type, hydroxylamine sulphate, benzanilide, and phenylhydrazine hydrochloride. There will be a great many specialty materials for unusual applications in industry, including caesium and rubidium salts for the manufacture of radio and cathode ray tubes, also amorphous boron, activated carbon for removing odors and tastes from liquids, diatomaceous earth products, and compressed gases for every type of industrial processing and for refrigeration, also thirty-three varieties of silicates.

Laboratory ware, also the heavy equipment and furniture for laboratories of educational institutions and industrial plants will be the subject of many exhibits at the Chemical Exposition. A full range of laboratory glassware for chemical, physical, biological, and metallurgical research will be shown. Features will include low expansion under heat, easy readability, precision markings. A new Liebig condenser will be offered. Newly introduced at the Exposition will be a new, rapid, accurate method for the definite detection of incomplete pasteurization of milk and cream. An electrical manufacturer will feature sodium and mercury arcs for laboratory use. Improved types of glass electrodes for pH determinations will be shown by several exhibitors. Innovations in this field include a "micro" glass electrode for testing samples of one-tenth of a drop of liquid, and a "spear type" unit for testing cheese, plastics, and so on. In the colorimetric field of pH measurement a new comparator will be offered for determining amounts of chlorine between 0.2 and 8.0 parts per million.

Additional specialties in laboratory equipment will include electrolytic apparatus for the determination of lead contamination in foods, also a filtering separator based on the centrifuge principle. This separator is said to make possible a saving of five dollars per student in courses of qualitative

analysis. A ten second spin precipitates solids, eliminating the usual filtering operations. Other laboratory equipment items on display will include oil testing apparatus, balances of many types, galvanometers, microscopes, photo-electric instruments, and a new instrument for potentiometric, conductometric, and dielectric constant analysis. One of the exhibitors of laboratory equipment will demonstrate a new ultra-centrifuge operating at a speed of 80,000 r.p.m., developing 250,000 times the force of gravity in a vacuum of two-tenths of a micron pressure. Special photographic equipment will be used to take pictures of the action inside the bowl while running.

Drying equipment for the laboratory will include ovens of many types. One new gas-fired oven is said to give interior uniformity tests within one degree Centigrade and temperature control within less than one degree Centigrade, over the entire operating range from 125 to 500 Fahrenheit. The same exhibitor offers electric ovens with the same analogous operating characteristics. Atmospheric and vacuum driers of several types will be offered for the chemical, food, and drug fields. Attention will be directed to the rapid drying at low temperature of solutions, slurries, extracts, or pastes to retain flavor or vitamin content, or to avoid decomposition. Innovations in laboratory filtering will include a new extremely low-ash filter paper that can be washed repeatedly without pulping; can be removed from the funnel and replaced without danger of tearing. Indicative of the broad relationship of chemistry to many industries will be the exhibit of a manufacturer of air classifiers which fractionate materials according to particle size. In terms of the pulverized materials which these machines classify, they are used to enhance radio reception

PURICO

WONDERBAR

(TRADE MARK)

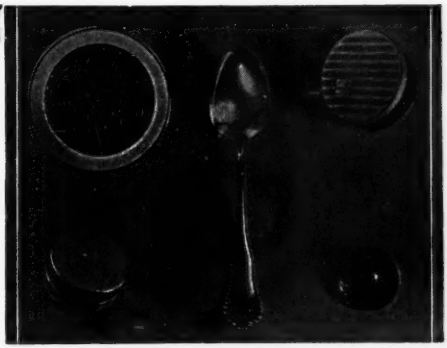
Pat. No. 2078876

Here's a pre-saponified buffing and polishing composition—SOLUBLE IN WATER.

Cleaning after Buffing consists in removing grease particles left by the Buffing compound. Since these particles in Purico Wonderbar are soluble in water, no brushing or scrubbing is necessary—depressions and holes are cleaned out simply and speedily.

Purico Wonderbar is ideal for buffing and polishing work with grooves, recesses, filigree, etc.

WRITE FOR CIRCULAR.



- Cleans easier and faster.
- Does not tarnish the work.
- Saves washing.
- No brushing or scrubbing.
- Saves by reducing rejections.
- Saves by reducing labor costs.

THE PURITAN MFG. CO., Waterbury, Conn.

(tungsten), advance water filtration (activated carbon), refine pharmaceutical products (aspirin), whiten paper stock (kaolin), improve lead pencils (graphite), protect vitreous ware (volcanic ash), accelerate grinding (abrasives), build better batteries (carbon), insure longer tire life (carbon black), and promote better building (Portland cement).

Plant equipment and processing machinery on display at the Chemical Exposition will cover all of the unit processes of chemical engineering also many operations related to the chemical industry. Crushing, grinding, and the separation of solids will be represented by many exhibits. One of the new micropulverizers is said to be dustless and capable of producing the finest grinds without the use of fans. It functions equally well on wet milling. These machines are equipped with new swing bolt assemblies which permit easier cleaning. On larger models the cover is hinged to the main frame and slide rails are provided to support the feed screw assembly when removed. Another manufacturer will feature roller-bearing, saw-tooth crushers; screen type pulverizers, heavy duty knife cutters; single deck motor-driven gyro-sifters, and disc grinders with built-in motors and cooling jackets. Features in such machines will include direct motorized drive and stainless steel construction. Sifting machinery will include a new full rotary motion sifter sturdily constructed and employing mechanical bearings throughout, without the use of flexible joints.

Filtration, in its relation to a great range of industries will be featured by many exhibitors. In addition to the customary fabric and woven wire media, filter cloth woven of glass will this year be on display. Special attention will be given to speeding up time and increasing efficiency in the handling of "unfilterables." A new interwoven, spiral wire matrix fabric will be shown for supporting and backing collector bags, filter cloths, also for separating dialyzing membranes. A new design of automatic filter will be shown for replacing the old time bag houses in the smelting field. Self-cleaning filters of the backwash type will feature no loss of backwash fluid, and low pressure drop. A new automatic self-cleaning filter operated by hydraulic mechanism will be shown for the first time.

Pumps on display, in addition to those earlier described, will include those capable of handling rarefied gasses at pressures less than .01 micron absolute pressure, and for handling asphalt mixed with as much as 30 per cent ground glass and slate dust. Other pumps will include high vacuum steam-jacketed, high-vacuum-with-oil clarifier, hard rubber, centrifugal, and rotary.

Accurate weighing in industry will be the theme of several exhibits. A new totalizing scale is designed to weigh automatically and indicate the amount of materials transported over belt conveyors. The totalizing unit may be located at any point remote from the operation.

Plastic molding by latest mass production methods will be demonstrated by operating exhibits. Pre-forming of mold charges of powder will be demonstrated by a toggle-type, 80-ton pressure machine capable of making preform tablets up to four inches diameter. Completely automatic molding machines, long the dream of the plastics industry, will be shown in operation. An automatic injection molding press first clamps the mold halves, under direct hydraulic pressure, then feeds the molding material, in original form, in measured quantities, heats the material to plasticity, and makes contact for the charge with the mold, and extrudes the charge into the mold cavities. Finally it opens the mold, and ejects the finished article.

Containers and packaging, import-

ant to so many industries will be represented at the Exposition by many exhibits. Containers on display will include bags, bottles, jars, boxes, cans, kegs, barrels, and drums. Equipment for filling, labelling, and handling each form of container will also be shown. One exhibitor will feature an automatic, multi-wall, paper valve-bag packing machine. Multi-wall bags of moisture proof construction will be shown for packing hygroscopic and deliquescent materials. While the valve type of bag has been restricted hitherto to pulverized materials, the new packer makes it adaptable to granular and crystalline materials. Paper lined textile bags with all-directional stretch will be demonstrated for handling a variety of chemical products.

Materials handling equipment will include hydraulic lifts, stackers, racks, and skids, also conveyors of varied types. One telescoping portable lifter with capacity of 750 pounds operates from an ordinary lamp socket. It is adapted to handling barrels, drums, carboys, cylinders, and heavy rolls of paper. Another electrically operated portable elevator has a revolving base. The convenience of this feature is found in factories where heavy rolls are rolled down warehouse aisles, placed on the elevator platform, revolved, elevated, and discharged onto a pile.

An electrical manufacturer will demonstrate a photo-electric spectrophotometer, a device used to measure the spectral reflectance of a variety of materials. In the same booth will be found an electrically operated thickness gauge for measuring the thickness of paint on metallic surfaces.

Publishers will be represented by books, catalogs, and magazines used in the chemical industry. One publisher is developing an unusually informative exhibit consisting of all new products developed since the last Exposi-

NEW 1938

Paasche TYPE BU Airbrush!

- Even greater coating speed!
- Width of spray up to 19 inches!
- Uniform pattern at lower and also higher airpressures!
- New multiplehead — two types and six sizes!
- Better engineered — Fewer Parts!

Mail coupon for full details —no obligation whatsoever.

Paasche Airbrush Co.
1910 Diversey Parkway
Chicago, Illinois

Send free bulletin.....
We want a demonstration—no obligation on our part.....

Guaranteed Staining FINISH WITH AIR Paasche

We airfinish .....
Name.....
Address .....
City ..... State.....

tion, two years ago. This exhibit will include only chemical raw materials, not finished consumer goods. A counterpart of this exhibit covering the two years preceding the 1935 Exposition was subsequently shown in several museums and finally became a part of the permanent exhibits at the Smithsonian Institution.

Presentation by Chemical & Metallurgical Engineering of their Third Award to the company in the process industries, which through the effective use of chemical engineering in any phase of its activity, has contributed the most meritorious advance to the industry and profession. The award consists of an appropriate bronze plaque, to indicate the nature of the achievement and the name of the company to which it is presented.

The Advisory Committee consists of: chairman, M. C. Whitaker, vice-president, American Cyanamid Company; Raymond F. Bacon, consulting chemist; L. H. Baekeland, Hon. Professor Chemical Engineering, Columbia University; William Callan, president, The Chemists' Club; J. V. N. Dorr, president. The Dorr Company; Henry B. Faber, consulting chemist; William G. Harvey, president, The Electrochemical Society; William Haynes, president, "Chemical Industries"; Charles H. Herty, industrial consultant; H. E. Howe, editor, "Industrial and Engineering Chemistry"; Martin H. Ittner, president, American Institute of Chemical Engineers; Sidney D. Kirkpatrick, editor, "Chemical and Metallurgical Engineering"; Charles Lichtenberg, president, Salesmen's Association of American Chemical Industry; W. T. Read, Dean Chemistry, Rutgers University; Charles F. Roth, Manager Exposition; H. J. Schnell, general manager, "Oil, Paint & Drug Reporter"; R. Gordon Walker, vice-president, Oliver United Filters Inc.; E. R. Weidlein, president, American Chemical Society.

Following the announcement of Norman E. Diehl of E. I. duPont deNemours & Co. as the winner of the chemical industries slogan contest, the winners of the ten second prizes have been selected as follows:

Robert D. Potter, News Editor
"Science Service"
Washington, D. C.

Edward J. Pechin
Wilmington, Del.

C. H. Hazard
Hazard Advertising Corp.
New York, N. Y.

Lenore K. McCafferty, Adv. Dept.
Hercules Powder Co.
Wilmington, Del.

Paul Elkin, Ed. Dept.
"Facts About Sugar"
New York, N. Y.

Matthew J. Schiebel
Wishnick-Tumpeer, Inc.
New York, N. Y.

Louis Paul Flory
Boyce Thompson Institute for Plant Research, Inc.
Yonkers, N. Y.

Foster D. Snell, Pres.
Foster D. Snell, Inc.
Brooklyn, N. Y.

Robert H. Muller
Nyanza Color & Chemical Co.
New York, N. Y.

Van B. Hooper, Sales Prom. Mgr.
The Louis Allis Co.
Milwaukee, Wis.

$5.00 prize awards have been made by the Exposition of Chemical Industries to all of the above. They have been selected as the winners by the

Advisory Committee of the Exposition, headed by M. C. Whitaker, as chairman. Acting as judges for the contest, this Committee spent considerable time in analyzing the many hundreds of slogans submitted.

Actual presentation of the first prize to Mr. Diehl will take place at the Exposition on the night of December 6, the opening day.

New Type Magnetic Separator. In a special four-page bulletin, Ferro Enamel Corporation, 4150 East 56th St., Cleveland, Ohio, announces the introduction of the new Stearns Magnetic Separator to the enameling industry.

Operating on an entirely different principle from former models this new type "QS" Magnetic Separator is said to have twice the collecting area heretofore available, according to Ferro engineers. Instead of the usual magnets and screen cartridge, the "QS" model has a series of highly magnetized screens through which the liquid is filtered—more than 21,000 lineal feet of active collecting edge.

Ferro engineers state that every precaution has been taken to eliminate contamination in the ceramic materials being cleaned. The coil windings are completely enclosed in a machined cavity and then sealed with a special compound so that no moisture can affect the operating efficiency of the unit. In case of any outside interruption of current a direct acting check valve closes against the head of the material and prevents any liquid from filtering through without coming in contact with the magnetized surface. The screen element is so installed that it can be easily removed for cleaning and the absence of dirt-catching cavities make cleaning a very simple operation.

Type "QS" Magnetic Separator is made by the Stearns Magnetic Manufacturing Company, Milwaukee, Wisconsin, and is handled exclusively in the porcelain enameling industry by Ferro. It is available in five sizes, all of which operate on any direct current voltage.

A copy of this bulletin sent free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

NEW-BETTER
HOMMELAYA PROCESS
of
Vitreous Enameling

The greatest development in the Porcelain Enameling industry in the past century is here—proved—accepted.

1) **Produces a perfect Porcelain Enamel finish with only ONE coat and ONE fire!**
2) **Cuts enameling costs by one-third!**
3) **Reduces possible chipping to an absolute minimum!**
4) **Produces a BETTER finish in ONE coat than regular enamel in two coats!**
5) **Ware may be finished in any color desired!**

Write us TODAY and learn more about this NEW, BETTER, INEXPENSIVE method of Porcelain Enameling.

THE O. HOMMEL COMPANY
209 FOURTH AVENUE, PITTSBURGH, PA. • NEW YORK OFFICE
421 SEVENTH AVENUE • FACTORY, CARNEGIE, PENNSYLVANIA

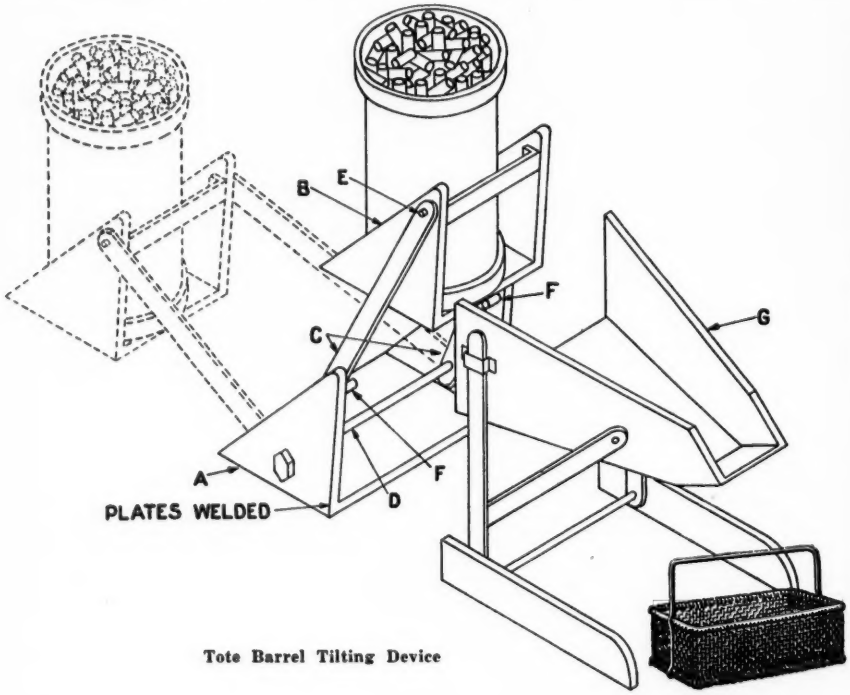
the FINISHING FORUM

Tote Barrel Tilting Device

By Charles H. Willey

THE device shown in the illustration is one which can be used to assist a plater in transferring small parts such as stampings from large tote barrels to small baskets of the type used in various degreasing processes. The toting device shown here consists primarily of a base frame A and a cradle frame B. Each of the frames is made of three pieces of 14 inch plates, which are welded at the joints. The width of cradle B is slightly smaller than that of base A. Cradle B is attached to the frame of base A by means of supports C. These supports are pivoted on axle D of base frame A and also on the pins E of the cradle frame B.

In use, cradle B is swung to the floor and a barrel filled with small



Tote Barrel Tilting Device

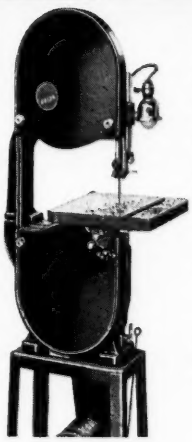
workpieces is rolled onto the cradle. The cradle and barrel can then be raised by the operator and also by means of the supports C to the stop pins F. With the barrel in this position, the contents can easily be unloaded into a chute G. A dipping placed at the end of the chute G to receive the small workpieces.

Duravalves. Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn., has just published a 4-page illustrated bulletin describing the distinctive new Hancock Duravalve. This valve is equipped with a leak-proof integral Stellite seat developed especially for high pressure, high temperature service.

Even expansion and contraction caused by excessive temperature change have no effect on Duravalves. The Duravalve splits at the top line of the seat. After the bonnet is removed, the integral Stellite seat is easily available for relapping, regrinding, or even re-Stelliting, if that should ever become necessary. The Duravalve is said to have a basic valve size with a constant ¾ in. seat. The same basic valve size can be tapped, or bored for welding for ½, ¾, or 1 in. pipe. These three sizes are said to cover 85 to 90 per cent of all the small valve requirements on any high pressure power plant job. Copy of the Duravalve bulletin free upon request.

Fostoria Handbook of Localized Lighting, now being distributed by The Fostoria Pressed Steel Corporation, Fostoria, Ohio, presents information on the following subjects: Good Lighting Practice, Selection of Supplementary Lighting Units, Standard Fostoria Supporting Arms, Standard Fostoria Reflector Assemblies, Efficiency Comparison Charts for Fostoria Reflector Assemblies, Standard Fostoria Base Attachments, Fostoria Complete Lighting Units, and Fostoria Localite Accessories and Parts. The booklet contains illustrations of the various types of Fostoria Lighting Units for use in industry, and lists specifications for these units. Copy free upon request.

NEW 14 IN. METAL-CUTTING
DELTA BAND SAW



The regular 14-inch Delta band saw, fitted with countershaft to reduce the speed, has been used in hundreds of shops for cutting Iron, Steel, Brass, Bronze and Aluminum bars, shapes and sheets, in foundries for cutting off gates, in die-casting shops for trimming and sawing castings.

Here is a new and improved back-geared model which is even more ideal for this work. It is the perfect machine for the general machine shop, toolroom or experimental shop, where many different materials must be cut.

It takes the place of a power hacksaw in cutting off bars and shapes; it is used in the toolroom for sawing off tool, die and fixture stock; it will cut uniform strips from sheets; it saves hours of time in cutting templates and similar tools, and will cut almost any material, such as asbestos, mica, vulcanite, fiber, etc. . . . difficult to cut by ordinary means.

Provision is made for four low metal-cutting speeds and one high speed for wood sawing.

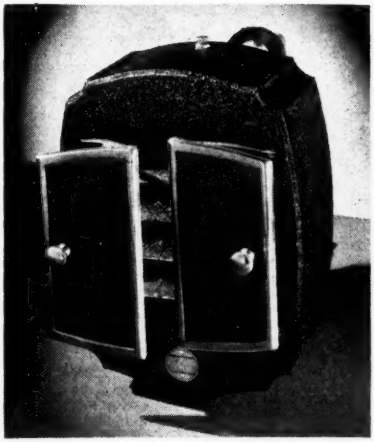
Write for special circular giving full details and specifications.

$79.50

14" Back-geared Metal-Cutting Band-Saw, complete with guards, 8" arbor pulley for wood and cone pulley for metal. With one 14-tooth metal-cutting blade. Without light attachment, belts, stand, motor or motor pulley. Shipping weight 175 lbs.

DELTA MFG. CO.
639 E. Vienna Ave., Milwaukee, Wis.

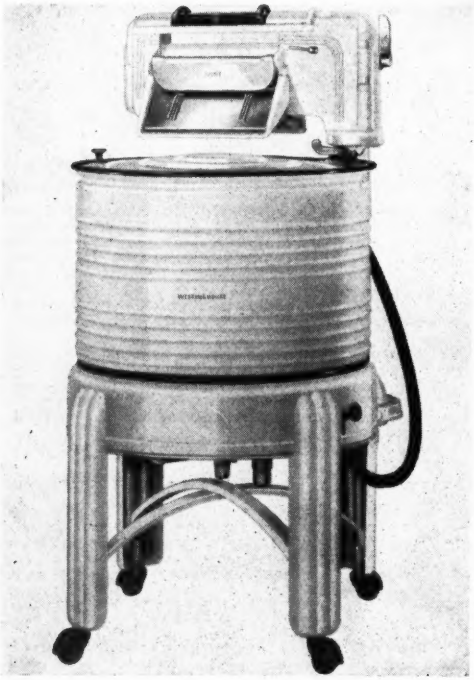
FINISHES THAT AID IN APPEARANCE AND UTILITY



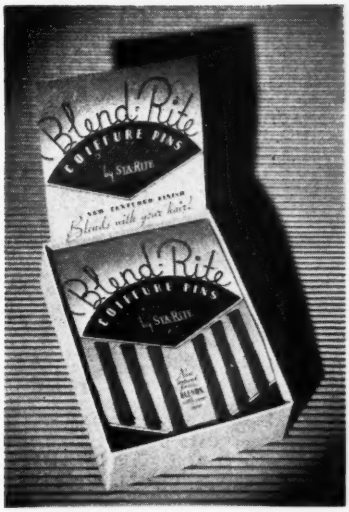
(Right)—The lines of the automatic heater shown herewith are accentuated by polished parts. These polished parts are assembled after the housing and doors have been decorated with a beautiful crinkled finish.

(Photo Courtesy Sherwin-Williams)

(Photo Courtesy Westinghouse Electric and Manufacturing Co.)



(Left)—This one-piece chassis de luxe washer is finished in gleaming white and trimmed in black.

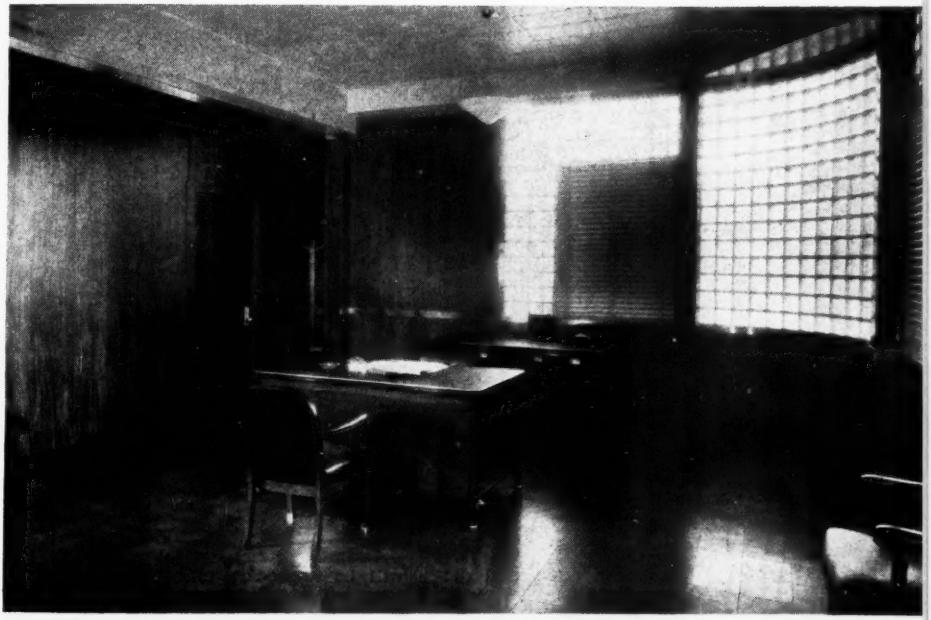


(Right)—The coiffure pins illustrated herewith are finished with a wrinkle texture finish colored to match any particular shade of hair.

(Photo Courtesy Sherwin-Williams Co.)

(Below)—Walnut grained steel sheets cover the interior walls of this office. The furniture is also of metal and walnut grained to match the walls.

(Photo Courtesy American Rolling Mill Company)



NEWS OF THE INDUSTRY

Detroit Rex Opens Cincinnati Office

In line with the general expansion program recently inaugurated, the Detroit Rex Products Company, 13017 Hillview Ave., Detroit, Michigan— manufacturers of Detrex Degreasing machines, Perm-A-Clor and Triad Solvents, and Triad Alkali Cleaners and Strippers— has opened a branch office located in the Provident Bank Bldg. at Cincinnati, Ohio.

This office will serve the lower Ohio and Indiana areas, as well as the northern section of Kentucky. A warehouse at Lockland, Ohio, will carry ample stocks and solvents, so that immediate delivery can be made to all points in this territory.

The addition of this new branch office will help to increase the scope of the personal service facilities offered by the company to its many customers in this area, and materially assist the company in maintaining its position of leadership in the industrial cleaning field.

Hammond Appoints Representative

The Hammond Machinery Builders, Inc., Kalamazoo, Mich., announce the appointment of Mr. W. J. Bach, 1400 Tenth Place, South, Birmingham, Ala., as a representative in the sale of grinders for foundry use. Mr. Bach will cover the territory of Tennessee, Georgia, Alabama, Florida, Louisiana, North Carolina, and South Carolina. This appointment has been necessary due to the steady expansion of business and the widening of the Hammond grinding line.

Patterson Foundry & Machine Company Appoints District Sales Manager

E. S. Boston has been appointed district sales manager of The Patterson Foundry & Machine Company, East Liverpool, Ohio, with headquarters at St. Louis, Missouri, and will have charge of the territory adjacent to St. Louis.

Mr. Boston is a chemical engineer, having graduated from the University of Wisconsin and the Armour Institute of Technology, Chicago. He was formerly associated with the laboratory of the Anaconda Copper Mining Company and also the Ohio Zinc Oxide Company.

Dumore Announces $10,000 Addition to Present Factory

A $10,000 addition is now being added to its factory at Racine, Wis., according to a news release which has been recently issued by The Dumore Company, Racine, Wis. The addition consists of two rooms for spraying and baking of paint. The new addition covers an approximate area of 640 square feet. It is completely fire-proof and air conditioned and is said to represent one of the finest and most complete finishing departments in that part of the country.

Richard Seipt Appointed Sales Manager of Laminated Shim Company

Laminated Shim Company, Inc., Long Island City, N. Y., manufacturers of Laminum precision adjustment shims, announces the appointment of Mr. Richard Seipt as sales manager. Mr. Seipt has been associated with the sales department of the Laminated Shim Company, Inc. for the past two years. Previously he was connected with John Wood Manufacturing Company as sales engineer.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

HILO BLACKS IN ACCOUNTING

Fifty years ago, when bookkeeping was done laboriously by hand, the accountant's only tool was a steel pen set in a wooden pen holder—the latter, more likely than not, finished in Hilo Black Baking Japan.

Bookkeeping and adding machines have replaced the steel pen and wooden penholder; and Hilo has kept pace with the times, for Hilo Blacks protect and beautify many of these modern accounting tools. Hilo Black Rip-Pl or Crystal, used with the japan, often add novelty and sparkle to the finish.

Mail the coupon for a free sample of Hilo Black Baking Japan and a copy of the descriptive bulletin, "Black Enamels and Japans."

HILO

HILO VARNISH CORPORATION

42-60 Stewart Ave., Brooklyn, N. Y.

BOSTON CHICAGO

HILO VARNISH CORPORATION
42-60 Stewart Ave., Brooklyn, N. Y.

Gentlemen: We'd like a copy of the revised bulletin "Black Enamels and Japans" and a free sample (type checked).

Gloss	**for use on**	**Wood**	**Air Dry**
Eggshell		**Steel**	**Baking**
Dull		**Cast Iron**	**250 F.**
Rip-Pl		**Brass**	**350 F.**
Crystal		**Aluminum**	

Company .....

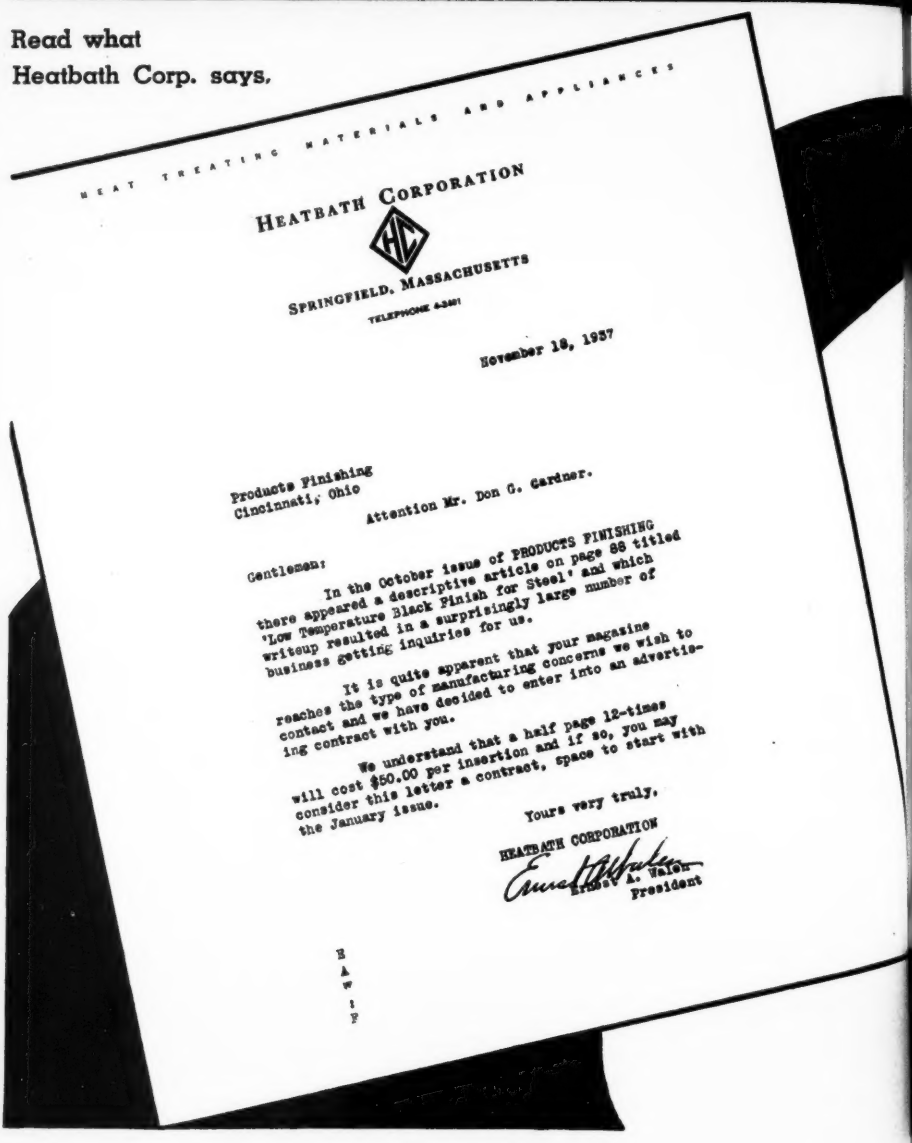
By..... Title.....

Address .....

City..... State.....

PRODUCTS FINISHING GETS BU

Read what Heatbath Corp. says.



HEAT TREATING MATERIALS AND APPLIANCES

HEATBATH CORPORATION

SPRINGFIELD, MASSACHUSETTS

TELEPHONE 4-3201

November 18, 1937

Products Finishing
Cincinnati, Ohio

Attention Mr. Don G. Gardner.

Gentlemen:

In the October issue of PRODUCTS FINISHING there appeared a descriptive article on page 88 titled 'Low Temperature Black Finish for Steel' and which writeup resulted in a surprisingly large number of business getting inquiries for us.

It is quite apparent that your magazine reaches the type of manufacturing concerns we wish to contact and we have decided to enter into an advertising contract with you.

We understand that a half page 12-times will cost $50.00 per insertion and if so, you may consider this letter a contract, space to start with the January issue.

Yours very truly,

HEATBATH CORPORATION

Ernest A. Walen
President

E
A
W
:
F

TS BUSINESS FOR HEATBATH CORP.!

quote:- . . . "resulted in a large number of **business getting** inquiries . . . your magazine reaches the concerns we wish to contact . . . consider this letter a contract to start with January issue."

Again PRODUCTS FINISHING demonstrates its ability to **get business,** this time for Heatbath Corp.!

Your advertising message in this magazine reaches the most complete, hand-picked list of important buying executives in its field and **sells!**

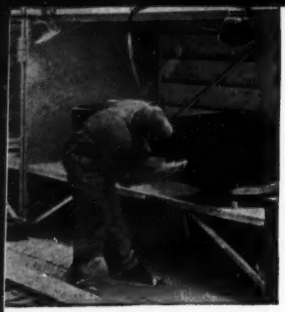
If you're interested in getting more business from the metal cleaning, plating, polishing or finishing industries go after it with PRODUCTS FINISHING.

PRODUCTS FINISHING

PUBLISHED BY

GARDNER PUBLICATIONS, Inc.

431 MAIN STREET • CINCINNATI, O.



NEW
Plant Equipment & Materials

Bousman Wolverette Vacuum Stills

For the reclamation of used industrial solvents, the Bousman Manufacturing Company, Inc., Grand Rapids, Mich., has placed on the market a vacuum still known as "Wolverette".

The Wolverette can be used in the reclamation of such solvents as naphtha, gasoline, oleum spirits, mineral spirits, Stoddard specifications solvents, kerosene, toluol, thinners, and so on. Distillation, or separation, according to boiling points, is the basic process of reclaiming such contaminated solvents for reuse.

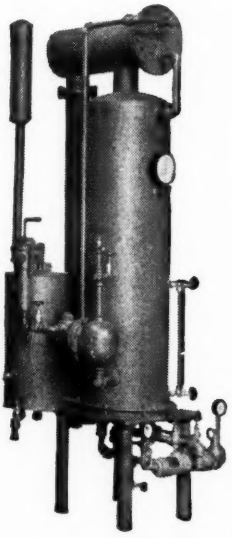
By means of maintaining a vacuum in the vaporizer, the boiling points of the solvents under distillation are materially reduced so that steam at suitably reduced and automatically regulated pressures (to match the properties of the solvent under distillation) is utilized as a vaporizing medium. The finest material of the correct properties to insure long service under conditions existing in the particular service for which the still is intended, are used throughout.

The Wolverette is designed so that every part is easily accessible and all parts are identical and replaceable. This assures economical maintenance and a long life for the equipment.

A suction line, run to a dirty solvent supply tank from the dirty solvent connection at the still, automatically feeds the still by means of the "suction" afforded by the vacuum maintained in the vaporizer by the pump at the condenser outlet. A float type feed regulator automatically matches the input of dirty solvent in the production of clean solvent, and maintains the proper solvent level in the vaporizer. A gauge glass indicates and affords visible check on this solvent level. A calandria type, all welded (electric arc) heating element presents a large heating surface of the most effective vaporizing design to the liquid in the vaporizing chamber. The vertical lines afford complete drainage and tend to prevent fouling.

A patented preheater provides for the utilizing of the hot vapors passing to the condensor for cooling, as a means of preheating the incoming dirty solvent, as it passes into the vaporizer. By the same means, the cold, incoming solvent, serves to precool the vapors before they enter the condensor. Thus, steam and water consumption are easily reduced by half, and the speed and general efficiency of the still doubled.

The Wolverette is furnished completely



Bousman Wolverette Vacuum Still

assembled and ready for installation as a complete unit. Accessories included are: high and reduced pressure gauges, compound vacuum gauge, dirty solvent strainer, steam trap, automatic feed and

level control, belt driven vacuum pump, and all necessary controls.

At an additional charge, a motorized pump assembly is furnished including the pump, explosion-proof motor, explosion-proof starting switch with overload protection, V-belt drive with pulley, mounted on a suitable steel base.

Maas and Waldstein Chrome Plating Rack Enamel

An enamel for insulating all but the contact points of the racks used in chrome plating has been developed by Maas and Waldstein Company, makers of industrial finishes, Newark, N. J., and placed on the market after extensive tests in all types of actual plating service.

This Chrome Rack Enamel effectively insulates all parts of the rack that it covers, thereby preventing the dissipation of the current. It is applied by dipping the racks (with the contact points protected by tape) into the enamel. Three or four coats are required, which can be applied at intervals of about 2 hours. After the final application, the coating becomes hard enough for use if forced-dried for 2 hours at 150 deg. F. or if air-dried for 24 hours. This work can be done in any plating shop. This enamel is supplied in two colors—red and black.

Heil Sawtooth Leads Anodes

Chrome plating anodes of sawtooth construction are being marketed by Heil & Company, 3088 West 106th St., Cleveland, Ohio. The sawtooth construction provides ten edges on one side for greater throwing power and electrical efficiency. The multiple edges on both sides of the anode are said to increase its effectiveness when used between two work rods.

A heavy central spine one-half in. thick running the length of the anode, connects directly with the hook, and thus insures a maximum current carrying capacity from top to bottom.

The angular construction gives stiffness and resistance to anode buckling or warping. Heil Sawtooth Anodes are made of extruded lead, and are said to provide a dense structure with a very high resistance to corrosion effects.

More than 50 per cent additional service per square inch of flat anode surface is obtainable in the sawtooth construction. The hooks are coated and integrally bonded to the lead anode to give a continuous metal conductor.

Cross Section of Heil Sawtooth Lead Anode

Three-Dip Detrex Degreaser

For those departments where economical, efficient cleaning processes are desired, the Detroit Rex Products Company, 13017 Hillview Avenue, Detroit, Michigan, offers a three-dip, hand-operated Detrex degreaser.

As can be seen from the cut-away illustration, the machine consists essentially of three chambers separated by wide dams which act as heat insulators. The chambers, from left to right, are designated as: the boiling chamber, the rinse chamber, the vapor chamber.

SAVE MONEY IN YOUR *FINISHING ROOM!*
WRITE DEPT. "F" FOR CATALOG
PACKER
Automatic
POLISHING & BUFFING MACHINES
THE PACKER MACHINE COMPANY MERIDEN, CONN.

The arrangement of the three chambers permits a straight line sequence of cleaning operations. The work, which is placed in large perforated baskets, can be handled by hand or by means of a hoist, depending upon the weight of the load. The baskets, containing the work to be cleaned, are lowered into the boiling solvent in the first chamber where the heavy contamination is removed. The continuous sweep of the boiling solvent over the work gives a washing or scrubbing effect that assists in the removal of solid particles and caked-on materials. After immersion in the first chamber, the work is placed in the second or rinse chamber. The temperature of the solvent in this chamber is lower than that of the boiling chamber and that of the vapor chamber—the temperature difference being maintained by the open air space in the dam separating the chamber. Immersing the work in the cool rinse lowers its temperature and, at the same time, flushes off the work. A final cleaning, reheating and drying are effected by placing the work in the third or vapor chamber. The work emerges from this chamber clean, warm, and dry —ready for subsequent operations. The entire cleaning cycle requires but a few minutes time at the most.

ALKALI CLEANERS

For All Purposes

ATTRACTIVELY PRICED and GUARANTEED to be THOROUGHLY MIXED and PULVERIZED

Write for further information.

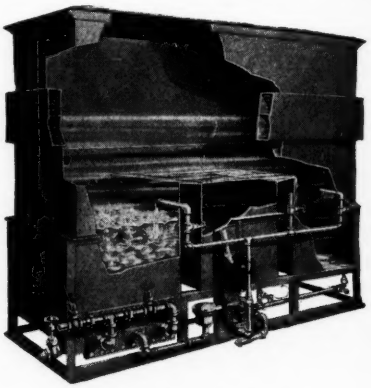
J. J. SIEFEN CO.

Everything for Polishing and Plating

1936 W. Lafayette Blvd.

DETROIT MICHIGAN

The water jacket and solvent collecting trough, which can be seen in the illustration completely encircle the machine. The vapors, which condense at the level of the water jacket, are collected in the trough and returned to the rinse chamber. This arrangement insures a continuous supply of clean solvent condensate for rinsing the work.



Three-Dip Detrex Degreaser

The machine is equipped with a vapor actuated, air-operated control system, consisting of thermostat temperature indicator and valve, which is used to regulate the heat input, control the height of the vapor column, and insure maximum operating economy.

In order to maintain constant solvent levels in the various chambers, a motor-driven solvent transfer pump is used to return the overflow to the boiling chamber. This pump is also used for the transfer of solvent from any one chamber to any other chamber when cleaning the machine or distilling the solvent. It may also be used when filling the machine with solvent.

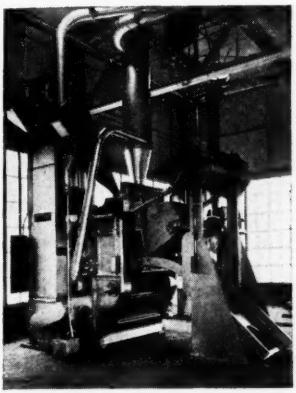
While the unit shown is arranged for steam heating of the solvent, models are available which employ gas or electric immersion heaters as the heating medium.

Overall dimensions of this unit are: 7' 1" long, 3' 6" wide, and 5' 6" high. The solvent capacity is 123 gal.

Small Wheelabrator Tablast

A small size Wheelabrator Tablast, designed for cleaning small parts, is being marketed by The American Foundry

Equipment Co., 557 S. Byrkit St., Mishawaka, Ind. This unit is designed for cleaning castings, forgings, or stamped



Small Wheelabrator Tablast

metal parts. Fragile parts or pieces which would be scratched or injured in a tumbling process can be cleaned in the Tablast.

The Tablast consists of a number of independent tables, the number and diameter of which can be varied. These tables are mounted on a spider which carries them directly under the blast zone. A motor-driven steel disc contacts the tables, rotating them eight times to each foot of travel. All work being cleaned is fully exposed to the blast, as the tables carrying the work turn constantly while in the blasting zone.

The Wheelabrator unit throws abrasive by centrifugal force. Hair lines, cracks, and minute defects in products being cleaned, are completely exposed, and the brilliant finish obtained by the Wheelabrator simplifies final inspection. The abrasive cycle is fully automatic. After abrasive is thrown from the wheel, it drops into a tapered hopper which feeds into the boot sections of an elevator. The elevator boot discharges by gravity into a rotary screen, where useless fins are removed. The clean abrasive then gravitates into a storage hopper and subsequently into the Wheelabrator, through a valved control. The abrasive is reused until it is reduced to a metallic dust which is sucked out of the machine by a dust collector.

A speed reducer on the table drive permits varying the speed of work through the blasting area and prevents the possibility of over and under-blasting. Any desired finish may be obtained by using the proper size shot or grit and adjusting the table speed for correct blast exposure.

The cabinet is of heavy steel plate, amply reinforced. The front half of the cabinet is cut away so that the operator can load and unload outside of the blast area. The opening across the front of the cabinet is heavily baffled with rubber curtains to prevent loss of flying abrasive. Dust seals are provided throughout the machine.

All Sizes

All Purposes

BUFFS

No buff user can fail to find the exact buff or polishing wheel needed for his job, in the big varied line, which also includes a full selection of bias constructed buffs.

Every buff is well made of the best materials obtainable. We carry stocks for making quick deliveries. The GEM shown here is one of our popular full disc styles.

BIAS BUFF & WHEEL CO., Inc.
430 Communipaw Ave., Jersey City, N. J.

A COMPLETE LINE

Alasticflint

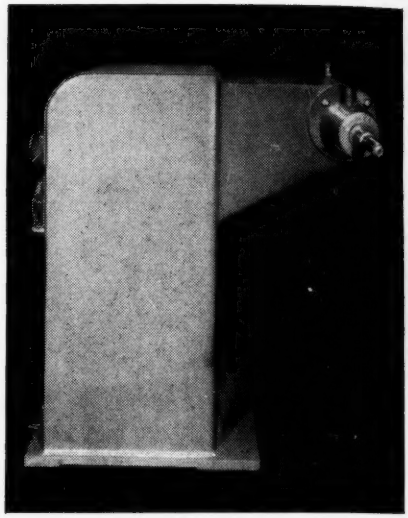
A paint compound which is said to be a combination thinner and binder, to be known as "Alasticflint", has been brought out by Elastic Compound Paint Co., Church Lane, Philadelphia, Pa. Alastic flint is said to be for use in red lead metal primers, aluminum paints, and enamels.

When Alasticflint is used by itself, it can be used as a varnish. It is said to be waterproof and oilproof and acid-resisting. When used in aluminum paint, it helps keep aluminum powder in suspension.

Crown Polishing Lathe

The Crown Rheostat & Supply Co., 1910 Maypole Ave., Chicago, Ill., has just announced a new polishing lathe, the main feature of which is a 14 inch overhang from the center of the spindle to the front of the base. This overhang is said to provide greater freedom in handling the work, especially large type pieces.

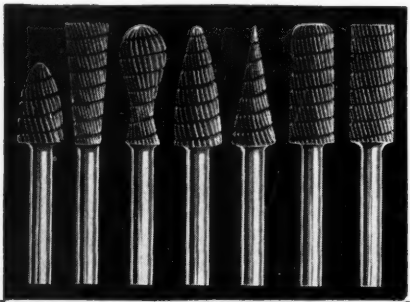
The base of the lathe is of welded steel construction, which permits greater control of the distribution of weight and



Crown Polishing Lathe

is said to provide an unusually well balanced unit. The spindle, due to its position, is accessible at all times. The motor is positioned so that it can be easily serviced merely by removing a handy steel guard.

This type of Crown lathe is available in capacities from 2 H.P. to 15 H.P. The weight of the new lathe is said to be substantially heavier than other Crown lathes of similar capacities. The extra weight is entirely in the base construction.



HAMILTON
MILL CUT ROTARY FILES

Eighteen standard shapes and sizes made up in five different cuts. Adaptable for all classes of work and for all kinds of materials. Try them on your next job.

We maintain a complete service for making special files. Write for circular and price list.

THE HAMILTON TOOL CO.
HAMILTON • OHIO

DeVilbiss Air Motor Drive for Agitators

The DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio, has recently announced an air motor drive for agitators built integral in paint drums. The unit consists of a standard air motor and a reduction unit. The equipment is said to offer an efficient and safe method of agitating paint in shipping containers prior to its delivery to the material feed system in the finishing department.

The equipment consists of two drivers, one for ½-inch square and one for ⅝-inch square on the agitator shaft. These drivers are threaded to fit the thread on the drive shaft. An adapter with 1-½-inch and 2-½-inch straight male

DeVilbiss Air Motor Drive for Agitators

thread, and 1-¼-inch female pipe thread to fit the openings in the paint drums is also included.

The unit is portable and may be transferred from one drum to another in a few moments time. The unit will operate from a 1 H.P. or larger air compressor dependent upon the speed of agitation required. The speed of the motor is adjustable from 10 R.P.M. upward.

Neville Paradene

A dark, coal-tar resin, to be known as "Paradene", has been placed on the market by The Neville Company, Neville Island, Pittsburgh, Pennsylvania. Paradene is a uniform resin, manufactured under carefully controlled conditions from a large unvarying raw material supply. It is brown to black in color. It is completely soluble in coal-tar (aromatic) solvents and may be formulated into varnishes containing 100 per cent mineral spirits.

Paradene softens under heating, and becomes plastic below its melting point and fluid above it. It is stable to heat up to 190 to 200 deg. C, slow decomposition resulting upon prolonged heating above these temperatures. Paradene is said to be chemically neutral and inert and resists water, alkalies, and dilute acids, as prolonged immersions have shown, as well as coumarone-indene resins, which have long been used where protection against such corrosive conditions is demanded. It is a brittle resin having a conchoidal fracture and high natural gloss. Its coal-tar origin is said to be responsible for its compatibility with a wide variety of resins, plastics, oils, rubber and rubber derivatives. Combinations of Paradene with these various materials may be made up by hot-melt mixing, by the use of a mutual solvent, or by heavy compounding employing a two-roll mill or a Banbury mixer. Pigments and fillers have been found to disperse rapidly and thoroughly in the molten resin, as Paradene seems to possess remarkable wetting power.

Plicote High Temperature Paint

A high temperature paint, which is said to withstand 1000 deg. F., to be known as "Plicote", is now being marketed by Fisher Scientific Co., 723 Forbes St., Pittsburgh, Pa. Plicote is available in cream, light gray, battleship gray, dust, brown, green, black, red, and aluminum. The high temperature aluminum paint is said to be the type that will withstand a temperature of 1000 deg. F.

Plicote is recommended for ovens, furnaces, steam pipes, exhaust pipes, stacks, and so on. The manufacturers state that it will not discolor, crack, peel or blister within the stated temperature range and that it dries rapidly, resulting in a smooth, brilliant silvery finish.

CHROME ANODES
NEW HEIL
SAWTOOTH TYPE

features:

← 1. 10 edges for greater throwing power.

← 2. 50% additional surface.

← 3. Extruded lead for long life.

← 4. ½" Central Spine for better conductivity — doubles corrosion resistance.

ALL AT PLAIN ANODE PRICES!

See your distributor or write us.

HEIL & CO.

Cross section showing new sawtooth design.

3088 W. 106th St.
Cleveland, O.

Also Tanks — Heaters — Chemical Resisting Lining — Leadburning.

Collord Flexible Rubber Insulation for Nickel Plating Units

A flexible rubber that is said to set a new high in insulation efficiency for all plating units with the exception of chrome has been placed on the market by Collord Inc., 7049 Lyndon Ave., Detroit, Michigan. This rubber insulation is said to be highly flexible and yet very firm in texture. It can be applied by the manufacturer to all metals used in the plating industry. It is also said to improve with age and use and does not "tree". The manufacturer states that racks in service for 18 months are still in perfect condition. Platers interested in this new material are requested to submit test units or specimen racks for treatment.

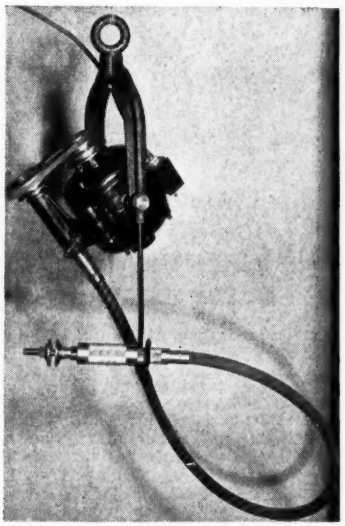
Bassick Truck Casters

A line of silent steel truck casters, fabricated by projection welding, is now being marketed by The Bassick Co., Bridgeport, Conn. The caster assembly is made up in three parts, the top plate and king pin being one unit. A large diameter ball race is provided. The parts are of heavy-gage wrought steel. The Bassick Casters are made in 3, 4, 5, 6, and 8 in. diameter wheels with stationary casters to match.

Stow "Assembly V" Flexible Shafting

Stow Manufacturing Co., Inc., Binghamton, N. Y., has brought out a three speed suspended assembly, to be known as "Assembly V". Assembly V is a three speed unit designed for production in shops where floor space is at a premium. It may be mounted on a trolley or suspended from a hook.

Assembly V is equipped with a ball bearing motor and a Stow ball bearing countershaft. The countershaft is provided with a screw for adjusting belt tension. Standard equipment includes switch, cord, plug and ball bearing hand piece with clamp spindle to take grinding wheels, buffs, scratch brushes and so on. Angle heads for special hand pieces can be furnished interchangeable with the standard hand piece. All Series 37 attachments are interchangeable in the same size range.



Stow "Assembly V" Flexible Shafting

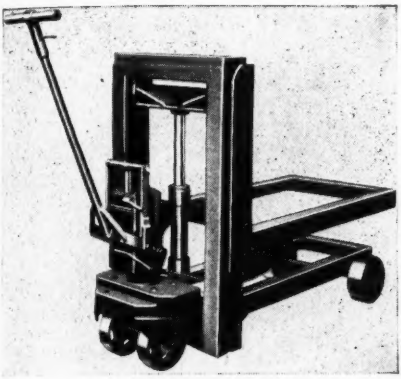
Motors are furnished for any electrical specification.

Lyon Cantilever-Type Hydraulic Lift Truck with 10-In. Elevation

The lift truck shown in the illustration, an adaptation of the standard Lyon Hydraulic Lift Truck made by Lyon Iron Works, Greene, N. Y., was designed for a special handling problem where 10-in. elevation was necessary instead of the usual standard 3-in. elevation. The 10-in. elevation is obtained with the cantilever-type elevating frame.

The hydraulic elevating feature provides exceptionally easy lift, easy control and easy handling. The truck shown is rated at 3500 lbs. capacity.

The lowered height is 9 in. and the elevated height is 19 in. The carrying



Lyon Cantilever-Type Hydraulic Lift Truck with 10-In. Elevation

platform is 24 in. wide by 42 in. long. The illustration shows the truck elevated to the full height of 19 inches.

Norblo Exhaust Fan

An exhaust fan, which is said to handle sawdust, shavings, refuse from buffing, polishing, and grinding wheels where the machines are piped directly to the fan and the fan blows into a cyclone cleaner, to be known as "Norblo", has been placed on the market by The Northern Blower Co., 6409 Barberton Ave., Cleveland, Ohio. The wheels of this exhaust fan are statically and dynamically balanced. All shafting is of high carbon steel. Self-aligning ball bearing pillow blocks are used.

On some of the larger fans, roller bearings are furnished and the fans can be equipped with babbitted and sleeve bearings. The fan housing and the motor base are made of steel plates reinforced with angle iron. The motor base is bolted to the housing.

Connecticut Portable Electroplating Machines

Portable plating machine to be known as the "Connecticut Portable Electroplating Machine" for plating on all common and precious metals has been placed on the market by the Nickel-Chromium Plating Corporation, 3429 West 47th St., Chicago, Ill. The Connecticut unit is said to produce durable plating for new or refinished work, decorative or protective deposits, touching-up damaged, defective or worn plating and hard plating tools and wearing surfaces.

The process whereby the Connecticut unit is used is known as the N.C.P. process.

This process actually amalgamates the two metals by brushing away any accumulated film occasioned by the chemical and physical characteristics of the base metal. Once properly applied, N.C.P. plating does not peel off. The plated piece is said to withstand bending, twisting, or tearing without separation of the two metals.

The Connecticut equipment consists of a special current supply unit, plating brush, anodes, electrolytes and suitable preparation compounds.

Nickel can be deposited to a thickness of .004 in. over an area of 10 sq. in. in approximately 15 minutes. There is a wide range of solutions available for specific applications.

Mayco Protective Coatings

Protective coatings, which are said to contain chlorinated rubber and acid and alkali-resistant plasticizers, to be mar-

STEEL EQUIPMENT
FOR ALL PURPOSES
Also Built Special To Order
Write for Catalog
ANGLE STEEL STOOL CO.
704 Oak St., Plainwell, Michigan

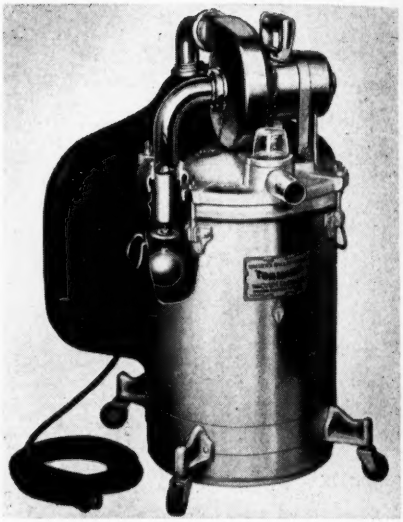
keted under the name of "Mayco", are now offered for the effective protection of plant and equipment against corrosion by the May Products Company, Inc., Newark, N. J. Various types are available which are claimed to be mo sture, acid and alkali-proof. Practical long range tests have proven the value of these coatings in the effective protection of metals against corros.on attacks of acid and alkali vapors and liquids.

Tornado Industrial Vacuum Cleaner

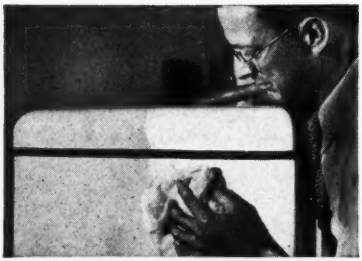
The Breuer Electric Manufacturing Company, 843 Blackhawk St., Chicago, Ill., announces important improvements in its line of portable Heavy Duty Industrial Vacuum Cleaners and also Tornado Portable Electric Blowers for removing dust and dirt from motors, machinery and industrial plants and processes.

The Tornado Portable Cleaner, Model 112, is now furnished with a new double size dust bag.

Tornado Blowers, Model 6A and 8A, are now built with enclosed ball bearing assembly and screen gauge over the end of motor housing to prevent excessive dust and dirt from getting into the motors.



Tornado Industrial Vacuum Cleaner



"MAGIC" TACK RAGS

IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.

4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.

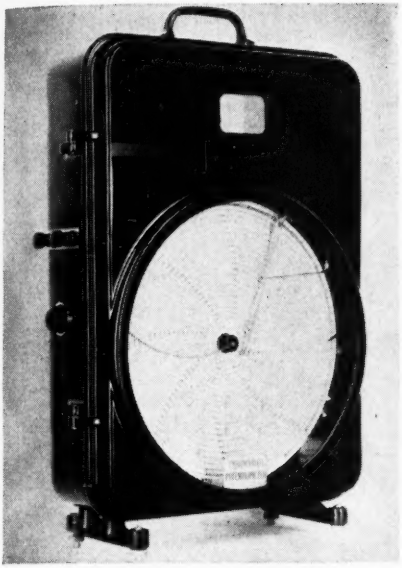
If your dealer does not carry Magic Tack Rags, write us for sample.

Bristol Portable Pyrometer

The instrument shown in the illustration is a Portable Recording Pyrometer which has been placed on the market by The Bristol Company, Waterbury, Conn. The simple operating principle of this instrument and its compactness of construction, affords special features that are especially useful for portable service.

The instrument is said to be unusually rugged and not affected by vibration and does not require careful leveling when in use. There are no continuously moving parts or trains of gears to become engaged and released to position the pen on the chart and no mechanical motion of any kind, except when a change in temperature occurs at the thermocouple.

When an unbalanced condition in the potentiometer circuit occurs, a series of relay-actuated switches operate a motor to position the slide wire contact to which the pen arm is mechanically connected. The galvanometer is equipped with a highly damped coil and the galvanometer arm is free to deflect at any time, not being periodically engaged by a clamping device.



Bristol Portable Pyrometer

The instrument is constructed so that it is composed of five separate replaceable units.

The Bristol Portable Pyromaster is available as a Pyrometer for ranges from 0 to 500 up to 0 to 3000 deg. F., using standard thermocouples. They are also available as resistance thermometers, for ranges from 20 to 350 deg. F. Provision is made on the case for suitable plugging devices to connect these instruments to the thermocouples or resistance bulb, and to a source of a-c power of 110 to 220 volts. The chart is 12 in. in diameter and rotation is by telechron clock.

Alox Rust-Preventive

Resulting from a process of oxidizing petroleum fractions under controlled procedure, a rust-preventive compound, to be known as "Alox" has been brought out by Alox Corporation, Buffalo Ave. & Iroquois St., Niagara Falls, New York. Solutions of Alox are available for dipping, spraying, or brushing on metal surfaces to produce thin, transparent, colorless, and corrosion-resisting films. Series 701 compound is recommended for use on ferrous metals and Series 702 for non-ferrous metals. It is claimed that these films are highly resistant to normal solutions of all acids, alkalies, and that they will stand temperatures up to 150 deg. F. without dripping or running from the metal surfaces on which they are applied.

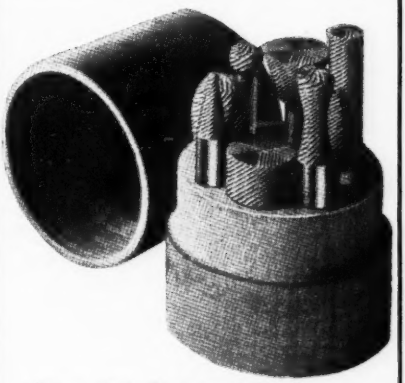
Films formed by Alox compound range in texture from soft lubricating films to hard films that are extremely resistant to the penetration of moisture and sunlight. The soft-forming films are claimed to be useful for the protection of metal surfaces against corrosion from the time it leaves the metal manufacturer to the final stages of fabrication. Hard-forming films are recommended where coats are intended to be permanent.

One of the uses for which the hard-forming film material is recommended is as a priming coat, where it will form a water and air-tight seal, either for the protection of smooth metal surfaces or roughened surfaces where corrosion has already begun.

DeVilbiss Rotary Spray-finishing Machine

The DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio, has announced a Rotary Spray-finishing Machine to be

ROTARY FILES

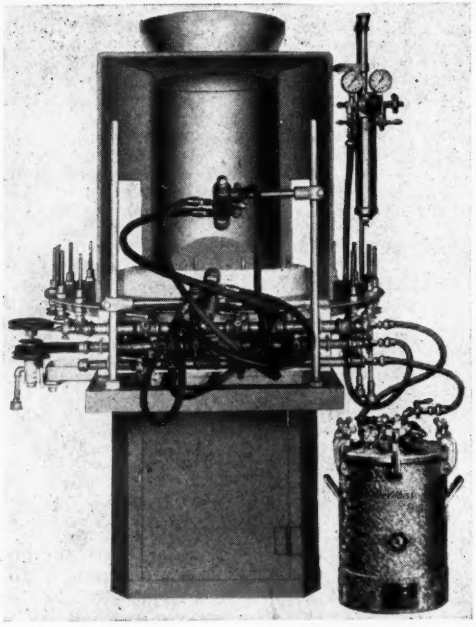


They Cut Faster—Last Longer

Ford Hand Cut Rotary Files are made of high Speed Steel. Write for information and prices.

M. A. FORD MFG. CO.

417 Pershing Ave. Davenport, Iowa



DeVilbiss Rotary Spray-finishing Machine

known as "Type YB", for high speed automatic finishing of small and medium sized articles. The machine is said to be capable of an approximate production up to and exceeding 3,600 finished, small, light-weight articles per hour.

The machine is equipped with spindles, automatic spray gun, automatic control valve, hose connections and other accessories of the modern spray-finishing unit. The unit is available in three sizes for light, medium and heavy duty.

Each unit is equipped with a speed reduction unit and may be operated at several different speeds to fit the requirements of the operation. If desired, the machine can be provided with a cam so that the spray gun operates at every second spindle when the machine is used for the finishing of larger articles.

The turntable is driven by a ¼ H.P. electric motor, the speed of which is determined by the work to be finished. The turntable will accommodate 15, 20, 25, 30, 40 and 50 spindles, the number of which is dependent upon the size of the pieces to be sprayed.

The exhaust chamber can be furnished especially designed to meet the individual requirement. The machine may be equipped with a drying oven if desired.

Acme Masks

A full-vision mask which is said to have wide lenses and which permits the wearer to see, read, work, and observe surroundings in safety has been placed on the market by the Acme Protection Equipment Co., 2601 Koppers Bldg., Pittsburgh, Pa. The lenses are made of shatterproof, laminated, polished glass and afford 90 deg. vertical and 170 deg. lateral vision. The canister mask is available in both corrugated tube and snout types. The light weight, all rubber facepiece is molded and curved to face-fitting proportions. Head harness connections are located in such a way as to eliminate forehead pressure points permitting the wearing of hat or helmet without discomfort.

To eliminate build-up of used air in the fresh air ducts, there are one-way

McALEER
A New Development
No. 23 White Chrome Coloring Compound for Mirror Lustre.
Write for Sample
McALEER MANUFACTURING CO.
2431 SCOTTEN AVE.
DETROIT, MICHIGAN

SMOOTHER SPRAY
—and smoother work, smoother production, with the Milburn paint spray gun. Wide, wet spray — easily adjusted.
WRITE FOR NEW CATALOG
The ALEXANDER MILBURN Co.
1436 W. Baltimore St.
Baltimore, Maryland

flap valve ends on the fresh air ducts which close upon exhalation. The full-vision mask is available with a piece of elastic, or rubber, or permanent non-rubber head harness and also a wide selection of canisters covering organic vapors, acid gases, ammonia and industrial smokes.

Crown Spray Gun No. 20

A paint spray gun having independently adjustable air and fluid ports, to be known as the "No. 20", has been placed on the market by Crown Spray Gun Co., 1216 Venice Blvd., Los Angeles, Calif. The No. 20 has a spray width control and a built-in air regulator. The spray head is self-centering. The No. 20 unit is available in different designs for use with suction feed cup, for use with pressure paint containers, and for use with hose connections with both fluid and air.

Finnell 82-X and 84-X Electric Floor Cleaning Machines

Heavy accumulations of dirt, oil, grease, metal shavings, and so on, can be removed from floors of wood, wood blocks or cement in industrial plants by the use of the 82-X or 84-X Electric Floor Cleaning Machines which have been placed on the market by Finnell System, Inc., 999 East St., Elkhart, Ind. Water or solvents are not required in connection with these machines in order to remove accumulations of grease or dirt.

The machine consists primarily of a heavy duty electric motor transmitting power through worm gears of special bronze to two brushes which rotate in a horizontal plane. Two wire scourifying brushes are employed, set into brush rings which are interchangeable. The rotating parts of the mechanism operate

Finnell Electric Floor Cleaning Machine

in oversize Timken roller bearings and the worm gears, together with a hardened, ground and polished nickel steel worm, are housed in a leak-proof gear case. The two brushes rotate toward the center of the machine, producing balanced operation even under extreme conditions.

The brushes are available in five standard sizes of steel wire to suit vari-

FREE!

Phone, Write or Wire

Our Engineering Department is available for designing new dust removal installations and improving your present systems. We will gladly study your problems, make suggestions and layouts without cost to you . . .

GEORGE KOCH SONS-EVANSVILLE, IND.

Builders of all types of Dust and Fume Removal Systems, Ventilating Systems, Spray Booths and Drying Ovens.

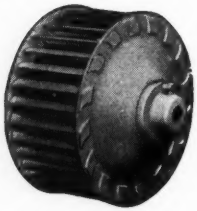
Over 60 years experience building Industrial Equipment

ous floor conditions. Each is refillable when worn, the plates being returned to the manufacturer for this purpose. Tampico or Palmetto fibre brushes can be used in addition to the wire brushes if desired.

Brushes of 11-in. diameter are used, the total brush spread being 22 in on each machine. A 1 h. p. General Electric motor is used on the No. 84-X machine, the No. 82-X machine employing a ¾ h. p. motor. Fifty feet of 14 gauge two-conduit rubber-covered cable is supplied with each machine.

Janette Blower Wheels

Janette Manufacturing Company, 556-558 West Monroe St., Chicago, Ill, is now manufacturing a line of blower wheels for use with air conditioning equipment, oil burners, coal stokers, and other apparatus where a blower of this type is needed. The wheels are made from a special grade of soft durable steel with rigid steel back plates. Hubs are of steel or cast iron, depending upon the size of the wheel.



Janette Blower Wheel

The blades are die-formed in pairs (except on double-inlet wheels 7 in. and larger in diameter) exactly alike in form, thickness, and weight. A single piece of 1/32-in. thick soft steel is formed into two blades, the section joining the blades being spot-welded to the back plates and the open ends being pressed into the slotted inlet disc and bent over smoothly, which is done with a special machine. On the larger wheels, these ends are also welded for added strength.

The forward curvature of the blades is scientifically designed to give the wheel high operating efficiency and a large volume of air output with a minimum of air noise.

The hubs of the smaller size wheels are machined from solid rock, and the larger hubs are of cast iron. Either internal or external hubs are available. Steel hubs are locked to the back plates by three embossed keys which, when the back disc and hub are pressed together, it into recesses in the disc. The end of the hubs which projects through the disc is then spun over to form a smooth joint. Cast iron hubs are fastened to the back discs by three rivets.

All wheels are statically balanced and finished with rust-resisting baked aluminum finish. Wheels can be furnished in sizes ranging from 5x1 to 12x6 in. single inlet, and 5x4 to 12x12 in. double inlet types.

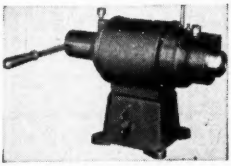
Crane Factory Drinking Fountains

The Crane Company, 836 South Michigan Ave., Chicago, Ill., has placed on the market a line of six new drinking fountains. They are made of vitreous china and sculptured in a modernistic, easy-to-keep-clean design that is both rugged and attractive.

The Erie line is offered in three new models. One of these, with integral strainer is equipped with two bubblers, automatic stream regulators, and improved self-closing valves and loose key stops. Other new Erie fountains include a single bubbler with push-button, self-closing ice water faucet and also a combination bubbler and ice water faucet with glass receptor. The new Ontario fountain with two bubblers is similar to the Erie except that it is of the roll rim type supported on brackets.

There are two fountains in the Oasis model. This model is of unusually distinctive design. The supply and waste

"NO-TARNISH"
#21 Brass #22 Silver #23 Copper
Durable clear finish for polished metals.
In use nationally for 20 years.
SPECIFY IF FOR OUTSIDE USE
Samples on Request
CLEAVELAND
LABORATORIES & MFG. CO., Inc.
447 Wilson Ave., Newark, N. J.

IDEAL SPEED LATHES

FOR LAPPING
FINISHING
POLISHING
SMALL PARTS
2 Speed Motor. Automatic Brake. Collet or 3 Jaw Chucks. Hand operated or automatic. Write for Cir. 351.
SCHAUER MACHINE CO.
903 Broadway Cincinnati, Ohio

CRANE "ONTARIO" DRINKING FOUNTAIN WITH TWO BUBBLERS

Crane "Ontario" Factory Fountain

fittings are concealed in a housing to improve the appearance and eliminate condensation. Both of the fountains have vitreous china backs, one 8 inches high and the other 15 inches high. Either of these fountains can be had with ice water faucets if desired. In all instances the bubblers are located above the rim to avoid back-siphonage.

Birdseye Spotlite Lamps

A lamp silvered on the inside, to be known as "Spotlite," has been placed on the market by the Birdseye Electric Co., 100 East 42nd St., New York, N. Y. The Spotlite is a self-contained unit in which the lamp and reflector are one. It is a combination of concentrator and diffuser, the shape of the bulb and the position of the filament being such that light is thrown directly on the job while a diffused light is thrown on the surrounding area. Concentrated beams are reflected from the parabolic curve in the upper globe while others are reflected from the side walls.

These Spotlites are available either with a standrd base or with a special swivel base that permits the beams to be adjusted readily. As the swivel is an integral part of the lamp, no special sockets are required. It can be used for high bay and floor lighting, and for throwing a light on moving assembly lines. The Spotlite comes in wattages rated at 100, 150, 200, 300, 400, and 500.

Hydromatic Drain Pipe Cleaner

A drain pipe cleaner, which has an air valve attachment to which compressed air lines can be fastened, to be known as "Hydromatic", has been placed on the market by Parker S. Atwood, 6 Bradley Ave., East Haven, Conn. This type of drain pipe cleaner is said to save pumping by hand. The Hydromatic operates on hydraulic-pneumatic principle, since shock and compressed air are directed against the column of water in the pipe. It is made of heavy seamless brass tubing with heavy brass castings at each end and comes complete with 14 different accessories. It has an air capacity up to 150 lbs. per square inch. The overall length is 1 ft. 7½ in. and a diameter of 4 inches. The weight of the Hydromatic is 9 pounds.

Blackmer Portable Rotary Pump

A Portable Rotary Pump has been developed by Blackmer Pump Company, Grand Rapids, Mich. This type of pump is offered in two sizes, with capacities of 10 and 20 gallons per minute. Like all other Blackmer Rotary Pumps, it incorporates the Blackmer "Bucket" design which results in automatic take-up for wear. This pump is said to give extra long service because it actually renews itself as it runs.

The illustration shows a V-belt drive from motor to pump which is completely enclosed by a removable guard. Silent chain drive can be furnished in place of V-belt if desired. The casters furnished

If you have a finishing problem of unusual difficulty

If you are interested in checking your present schedule for economy

If you are merely curious as to what we have to offer

WRITE

The Varnish Products Co.

5208 Harvard Ave. Cleveland, Ohio

Clear Lacquers—Etching Lacquers—Heatproof White—Bronzing Vehicles—R-700—CEL-U-LAK Primers and Surfacers—Lacquer Enamels — Lacquer Cements — SPECIALTIES.

Blackmer Portable Rotary Pump

are free-swinging type, making the outfit an easy one to move from one pumping job to another. The unit can be furnished without casters where a permanent installation is required. The pump can be driven from a lighting circuit, tapping in at the nearest electric outlet.

The Blackmer portable unit can be used for pumping practically any liquid of any viscosity. It is positive in displacement, designed for high suction lifts, and requires no priming.

Bremil All-Alloy Portable Hand Shear

The claim is made by Bremil Manufacturing Co., 1725 Pittsburgh Ave., Erie, Pa., manufacturers of the Bremil All-Alloy Portable Hand Shear, that the mill type shear will cut, without springing the jaws, strip or sheet metal of any width or thickness, regardless of carbon content, that the operator has strength to cut. The shear parts are heat treated to obtain the closest possible physical properties. The shear has successfully been operated on ¼ in. thick .40 carbon stock. The shears are equipped with removable cutting blades made from the finest grade alloy (shear blade) steel accurately machined, heat treated and surface ground to insure accuracy. The replacement feature makes it possible to replace worn out blades, thereby making the shear as good as new at a nominal cost.

Bremil All-Alloy Portable Hand Shear

The shear is made in two sizes. The smaller shear will cut up to No. 11 gauge sheet with ease and do it consistently without springing the jaws. This gives the shear a range well within the requirements of the average sheet metal worker. Its weight, 22 lbs. makes it an ideal portable tool. The construction is perfect for use as a bench shear.

Sabin Type A3 Hand Truck

The Sabin Machine Co., 6538 Carnegie Ave., Cleveland, Ohio, has recently placed on the market its Type A3 Truck, adapted for convenient and speedy handling of wood or steel barrels and drums from keg size to 36 in. high.

This new truck is featured by an attachment device consisting of a hook and a tongue member adjustably mounted on the vertical column. In operation, the tongue member is positioned about one inch above the lower edge of the barrel chime while the truck is held against the barrel at both top and bottom. The hook is then placed over the edge of the barrel and the

wheels allowed to roll back until the tongue slips under the lower edge of the chime. By means of the handle and the foot pedal the wheels are now pushed

Sabin Type A3 Hand Truck

up to the load, which is thus raised off the floor and attached to the truck. It is then quickly tipped to the balancing position and easily moved.

The wheels are 10 in. by 3 in. mounted on roller bearings, and can be furnished with steel, hard-rubber or pneumatic tires. The axle is 1¼ in. in diameter and the overall width of the truck is 25 in. It is stated that with this new type of truck one man can easily pick up and transport loads up to 900 lb., the design being particularly adapted for operation in restricted spaces.

Armco Zincgrip

Armco research is said to have perfected a revolutionary type of galvanized sheet with a heavy coating of commercially-pure zinc that will not crack or peel when it is subjected to relatively severe drawing or forming operations, according to an announcement made recently by The American Rolling Mill Company, Middletown, Ohio.

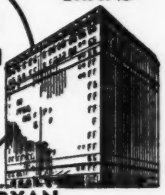
The new material, produced in both sheets and coils, is appropriately known as "Zincgrip". It is said to carry from 50 to 75 per cent more protective zinc than tight coat sheets generally used for fabricated products.

Up to now, hot dipped zinc-coated coils in sheet widths have not been produced. Armco Zincgrip, from 16 to 28 gage, is made available in any of the basic grades of galvanized iron or steel sheets and strip manufactured by the company.

It is an accepted fact that zinc provides an excellent protective coating for iron and steel sheets. Broader use of heavily coated galvanized sheets has been restricted only because relatively severe fabricating operations fractured the zinc coating.

With the new Armco Zincgrip sheets, exceptionally good adherence is obtained irrespective of the weight of the coating, the company's metallurgists say.

Potential applications are said to open new fields for the use of zinc-coated Armco Ingot Iron and steel. For more than a year, Zincgrip has been used in the production of spiral corrugated lock-seam drainage pipe and has proved en-

Hospitality
FIRST and ALWAYS at
HOTEL
MELBOURNE
LINDELL AT GRAND
400 ROOMS WITH BATH FROM $2.50 UP

J. K. BRYAN
Manager
ST. LOUIS

tirely satisfactory, the company's announcement says.

According to extensive experiments made by the company and by fabricators, it is well suited for other products such as roof drainage parts, shapes and stampings made by cold drawing and rolling processes, and many other applications.

Tests have been made for a variety of commercial articles, which have been drawn and formed from Zincgrip with only slightly more care than is normally exercised with uncoated sheets. For instance, refrigerator water shed pans are being successfully drawn to a depth of five inches, and the coating remains intact.

Zincgrip's highly protective coating and its ability to withstand a heavier draw than has ever before been accomplished with full-weight galvanized sheets makes it attractive for many kinds of fabricated products where resistance to corrosion is desirable.

Clark Tote Pan Truck

A self-loading and unloading tote pan truck of tubular steel, electric welded construction has been placed on the market by All Steel Welded Truck Corporation, 1123 Railroad Ave., Rockford, Ill. The truck is equipped with two vertical straps and has a capacity of 1000 lbs. The extended arms which fit under the tote pan flanges enable operators to pick up pans singly or nested.

Clark Tote Pan Truck

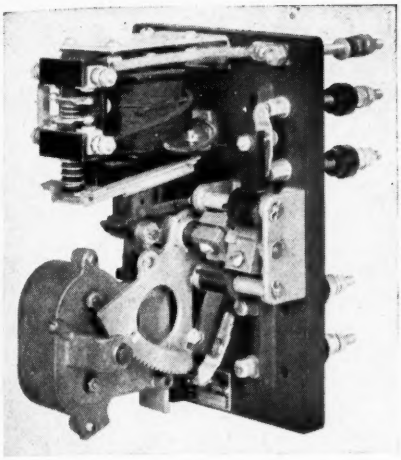
Standard equipment includes two six-in. diameter semi-steel or Goodrich rubber wheels, fitted with Hyatt-type roller bearings. The truck is available for all standard sizes of tote pans.

Check in DeWITT OPERATED HOTELS
✓ Genuinely Friendly
In CLEVELAND it's
✓ The HOLLENDEN
In COLUMBUS it's
✓ The NEIL HOUSE
In AKRON it's
✓ The MAYFLOWER
In TOLEDO it's
✓ The NEW SECOR
In JAMESTOWN, N. Y., it's
✓ The Jamestown and
✓ The SAMUELS

G-E Definite-Time Relay for Sequence Operations

Of particular importance to machinery manufacturers and users should be the "G-E Definite-Time Relay" employing a clutch-type time-delay interlock developed by the General Electric Company, Schenectady, N. Y., to provide a reliable means of timing a sequence of operations in a control system. Available in either a-c or d-c forms with 2, 4 or 6 circuits, the CR2820-1729 is extremely flexible and is well adapted for use wherever it is desired to perform several operations in sequence.

Typical applications of this relay include: operating accelerating contactors; starting several motors at intervals to avoid excessive line current; and starting different parts of machines or processes



G-E Definite-Time Relay for Sequence Operations

where delayed starting of some parts is desirable.

The relay consists of a solenoid and a plunger which is mechanically connected to the time-delay mechanism and to a shaft that operates the contact fingers. On the d-c forms a separate small instantaneous cutout switch is mounted on front of the solenoid.

Positive and uniform operation is assured by coil springs which give a constant pull on the timing mechanism throughout the entire operating cycle. Since a "free-wheeling" clutch principle is used on the time-delay mechanism the relay is always in gear and accuracy is maximum.

Ebonized Monel

The research engineers of the Huntington Works of The International Nickel Company, Inc., 67 Wall St., New York, N. Y., have recently introduced an ebony finish for monel metal, to be known as "Ebonized", for use where appearance must be maintained under temperatures up to 1400 deg. F. The material is said to be identical with standard Monel except that a lustrous blue-black finish is imparted in a special oxidizing operation. It has been created particularly for use for a newly designed heat deflector which is used in Chromalox super-speed range units.

Element pans, reflectors and deflectors in all of the electric heating units equipped with the Ebonized Monel are said to possess complete rust immunity and resistance to corrosion in addition to resisting discoloration from relatively high temperatures.

Thermag Skylights

A skylight, which is said to reduce heat transfer to a very low point, to be known as "Thermag", has been placed on the market by J. Merrill Richards, 110 West First St., Boston, Mass. Solar radiation is said to be retarded with this type of skylight. The units are constructed of special glass supported by an insulated reinforced concrete grid. The concrete is used as a supporting structure, since its heat transfer is less than that of metal. The joints between units have a zone of thermal insulation. Light-diffusing design is embossed on the inner surfaces and both outer surfaces are smooth and easily cleaned. Diffused sunlight is distributed with even intensity over wide areas and objectionable concentrations of bright light and shadows are said to be eliminated.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

IN PHILADELPHIA IT'S THE

HOTEL PHILADELPHIAN

39th and Chestnut Streets
Philadelphia, Pa.

Conveniently located to all Stations, and only five minutes from the heart of the business section.

★

600 ROOMS
600 BATHS

★

Room with Bath from $2.75 up

INDEX TO ADVERTISEMENTS

Alrose Chemical Company 2
American Air Filter Co., Inc. 4
Angle Steel Stool Company 53
Ault & Wiborg Corporation 13
Barlum Hotel 60
Bias Buff & Wheel Co., Inc. 49
Carborundum Company, The 21
Cleaveland Laboratories & Mfg. Co., Inc. 58
Delta Mfg. Co. 39
Detroit Rex Products Co. 6
DeWitt Operated Hotels 62
Egyptian Lacquer Mfg. Co. 17
Ford Mfg. Co., M. A. 55
General Abrasive Company, Inc. ..... Second Cover
Hamilton Tool Co., The 50
Heil & Co. 51
Hilo Varnish Corp. 43
Hommel Co., The O. 37
Juergens Co., Wm. A. 54
Kirk & Blum Mfg. Co., The ..... Fourth Cover
Koch Sons, Inc., George 57
McAleer Manufacturing Co. 56
Melbourne Hotel 61
Milburn Company, The Alexander 56
Norton Company 3
Oakite Products, Inc. 1
Paasche Airbrush Co. 35
Packer Machine Company, The 47
Parker Rust-Proof Company 27
Philadelphian, Hotel 63
Puritan Manufacturing Company, The 33
Schauer Machine Co. 58
Siefen Co., J. J. 48
Udylite Company, The ..... Third Cover
Varnish Products Co., The 59
Young & Bertke Co. 52

PRODUCTS FINISHING
Published by GARDNER PUBLICATIONS, Inc.
431 MAIN STREET, CINCINNATI, OHIO